FOREWORD

THE PURPOSE OF THIS MANUAL IS TO PROMOTE THE ADOPTION OF SOUND, UNIFORM PRACTICES AND PROCEDURES, BY PROVIDING TECHNICAL INSTRUCTIONS ON THE SUBJECTS LISTED IN THE INDEX.

COUNCIL RELIES ON THE COMPETENCE, GOOD WORKMANSHIP AND INTEGRITY OF ITS EMPLOYEES TO PROVIDE A HIGH STANDARD OF SERVICE TO ITS CUSTOMERS. ACCORDINGLY, EMPLOYEES WHOSE DUTIES RELATE TO THE MATTERS DEALT WITH IN THIS MANUAL SHALL FAMILIARISE THEMSELVES WITH THE RELEVANT CONTENTS AND NOT DEPART FROM THE PRACTICES AND PROCEDURES LAID DOWN WITHOUT SPECIFIC DIRECTION.

SUGGESTIONS ARE SOUGHT FOR IMPROVEMENT OF THE MANUAL AND SHOULD BE DIRECTED THROUGH YOUR SUPERVISOR.

CHIEF ENGINEER

TECHNICAL INSTRUCTION NUMBERING SYSTEM

BRANCH	TITLE	VOL.NO.	COLOUR	NUMBER SERIES	SECTION
Distribution	Spare		Red	0001 - 0999	
"	Mains U.G.	1	Red	1000 - 1099	Cable Laying
"	Mains U.G.	2	Red	1100 - 1199	Jointing General
"	Mains U.G.	3	Red	1200 - 1299	Jointing Drawings
"	Mains U.G.	4	Red	1300 - 1399	
"	Spare		Red	1400 - 1499	
Distribution	Mains O.H.	1	Red	1500 - 1599	Poles
"	Mains O.H.	2	Red	1600 - 1699	Construction
"	Mains O.H.	3	Red	1700 - 1799	Services
"	Mains O.H.	4	Red	1800 - 1899	
Distribution	Mains General	1	Red	1900 - 1999	Street Lighting
"	Mains General	2	Red	2000 - 2099	Survey & Mapping
"	Mains General	3	Red	2100 - 2199	Design & Data
"	Spare		Red	2200 - 2999	
Distribution	Substations	1	Blue	3000 - 3099	Zone
"	Substations	2	Blue	3100 - 3199	Distribution
"	Substations	3	Blue	3200 - 3299	General
"	Substations	4	Blue	3300 - 3399	
Distribution	Switchgear	1	Blue	3400 - 3499	High Voltage
"	Switchgear	2	Blue	3500 - 3599	Low Voltage
"	Switchgear	3	Blue	3600 - 3699	General
"	Switchgear	4	Blue	3700 - 3799	
Distribution	Transformers & VR	1	Blue	3800 - 3899	Transformers
"	Transformers & VR	2	Blue	3900 - 3999	Voltage Reg.
"	Transformers & VR	3	Blue	4000 - 4099	General
Distribution	Protection	1	Blue	4100 - 4199	Systems
"	Protection	2	Blue	4200 - 4299	Relay & Fuses
"	Protection	3	Blue	4300 - 4399	Overvoltage
"	Protection	4	Blue	4400 - 4499	
Distribution	Telecontrol	1	Black	4500 - 4599	
"	Telecontrol	2	Black	4600 - 4699	
"	Telecontrol	3	Black	4700 - 4799	
"	Spare		Black	4800 - 4999	
Distribution	Plant & Tools	1	Green	5000 - 5099	Mobile Plant
"	Plant & Tools	2	Green	5100 - 5199	Sundry Equipment
"	Plant & Tools	3	Green	5200 - 5299	Tools
"	Spare		Green	5300 - 5499	
Design & Const.	Building Works	1	Sky Blue	5500 - 5599	
"	Building Works	2	Sky Blue	5600 - 5699	
"	Spare			5700 - 5999	
Transport Ser.	Transport Maint.		Brown	6000 - 6999	
Elect. Inst.	Install. Inspect.	1,2,3	Yellow	7000 - 7199	
"	Service Marking	1,2	Yellow	7200 - 7299	
"	Metering	1,2	Yellow	7300 - 7399	
"	Appl. Repairs	1,2	Yellow	7400 - 7499	
"	Customer Subs.		Yellow	7500 - 7599	
"	Large Install.		Yellow	7600 - 7699	
"	Spare		Yellow	7700 - 9999	

METER INSTALLATION TECHNICAL INSTRUCTION MANUAL

VOLUME 1 - INSTRUCTIONS TO FIELD STAFF
VOLUME 2 - INSTRUCTIONS TO SUPERVISORS

VOLUME 2 - CONTENTS

TECHNICAL INSTRUCTION		SUBJECT
7331		DETERMINING METERING REQUIREMENTS
	1.	General
	2.	New Installations
	3.	Additions to Existing Installations
	4.	Full Load Current
	5.	SAA Wiring Rule 2.5
	6.	Examples
7332		SELECTION OF METERING EQUIPMENT
	1.	Selection of Metering System
	2.	Direct - Connected Meters
	3.	CT Meters
	4.	Selection of CTs
	5.	Replacement of CTs
7333		MARKING FOR METERING FACILITIES
	1.	General
	2.	Notice
	3.	Giving of the Notice
	4.	Unsatisfactory Meter Positions
	5.	Charges
	6.	Historical Buildings and Special Development Areas
	7.	Location, Accessibility and Protection of Service Equipment
	8.	Accommodation for Metering Equipment
	9.	Alterations and Additions to Existing Installations
	10.	Battens
	11.	Controlled Loads
	12.	Arranging for Metering

COUNCIL'S PUBLICATIONS

		ISSUED DATE
E.I. 1	"Customer Supply Procedures"	December, 1985
E.I. 2	"Customer Supply Inquiries"	November, 1985
E.I. 3	"Ready For Test Certificates"	February, 1986
E.I. 4	"Temporary Wiring"	March, 1983
E.I. 7	"Provisions for Service Equipment in Single Domestic and Small Installations"	August, 1984
E.I. 8	"Provisions for Service Equipment in Multiple Installations"	September, 1981
E.I.10	"Domestic Tariffs"	July, 1986
E.I.11	"Off-Peak Tariffs"	December, 1986
E.I.13	"Domestic Electrical Installations"	September, 1985
E.I.14	"Current Rating of Electrical Equipment"	June, 1979
E.I.18	"Metering Which Requires the Use of Current Transformers"	September, 1983
E.I.19	"Alterations and Additions to Existing Installations"	July, 1986

Manual METER INSTALLATION | N° 7331
Volume 2 | Date 12/86

Subject DETERMINING METERING REQUIREMENTS

This Instruction sets out the method of assessing the demand of a separately metered portion of an installation in order to determine the metering requirements.

CONTENTS

1. GENERAL
2. NEW INSTALLATIONS
3. ADDITIONS TO EXISTING INSTALLATIONS
4. FULL-LOAD CURRENT
5. SAA WIRING RULE 2.6
6. SAA WIRING RULES (APPENDIX G)
7. EXAMPLES
8. ISSUE

1. GENERAL

The assessed maximum demand of a separately metered portion of an installation is to be used to determine metering requirements.

If the assessed demand does not exceed 80A, one single-phase meter only is necessary. Should the demand exceed 80A, but not 160A, two single-phase meters are required. Similarly, if the demand exceeds 160A, three single-phase meters are required.

In certain circumstances, a customer may require metering for additional phases in excess of the number normally provided by Council. Reference should be made to Service and Installation Rule 2.8 regarding the circumstances in which additional phases may be provided without charge.

Refer to T.I. 7332 for selection of metering equipment.

2. NEW INSTALLATIONS

2.1 Single-Domestic Residences or Units

A single phase meter for metering at the domestic tariff shall be provided where the load of a single-domestic residence or unit consists only of lighting, G.P.O.'s, water heating and cooking, together with up to a total 20 A of air conditioning or space heating. Should there be loads additional to these, the need for additional metered phases shall be determined by calculating the maximum demand using Clause 2.6 of the SAA Wiring Rules.

Where it is proposed to give three-phase supply, it is to be assumed that the "basic" maximum demand constituted by lighting, GPOs, water heating and cooking, together with up to a total of 20A single-phase of air conditioning or space heating, is 25A per phase. Any load outside these categories (e.g. air conditioning or space heating exceeding a total current of 20A single phase, spas, saunas, pool heaters, kilns, large workshops, etc.) not being separately metered is to be added to the "basic" demand of 25A per phase after the application of the diversity factors contained in Table 1.

2.2 Retirement Villages, Hostels and Motels

The metering required for a group of units where all units are not being individually metered, is to be determined as indicated in Clause 1 by calculating maximum demand using SAA Wiring Rule 2.6.

Where it is proposed to give three-phase supply the "basic" maximum demand is to be taken from Table 2. Any communal loads (e.g. car parking ventilation, saunas, pool heaters, community rooms recreation facilities, commercial areas, etc.) not being separately metered should be added after the application of the diversity factors in Table 1.

Motel units shall be assumed to have the same demand as gas/electric units.

2. NEW INSTALLATIONS (Cont'd)

2.3 Commercial, Industrial and Other Loads

The number of metered phases required is to be determined as indicated in Clause 1 by calculating maximum demand in accordance with SAA Wiring Rule 2.6.

Where it is proposed to give three-phase supply, the diversity factors in Table 1 are to be used to assess the maximum demand.

3. ADDITIONS TO EXISTING INSTALLATIONS

3.1 General

Where a customer applies for the connection of additional loads and consideration is being given to altering the metering requirements, any proposed disconnections should be taken into account in assessing the new maximum demand.

3.2 Domestic Premises (Including Motels)

Maximum demands shall be determined as for new installations in accordance with Clauses 2.1 or 2.2 as appropriate. However, where bottom-connected meters are installed for single-domestic residences or units, maximum demands for separately metered portions of an installation should be calculated using the diversity factors in Table 1 for the purpose of determining the required meter rating.

Information regarding existing connected load should be obtained by inspection of the switchboard.

3.3 Commercial, Industrial and Other Loads

The preferred method of determining the new maximum demand is by measuring the existing demand and adding the calculated increase. The latter shall be calculated in accordance with Clause 1 where it is necessary to determine whether additional phases are required. If it is necessary to determine the adequacy of the metering for a three-phase supply, the increase will be assessed by the application of the diversity factors in Table 1.

In determining the existing demand by measurement, it will usually be necessary to add an allowance to the load actually measured to take into account the difference between the load at the time of measurement and peak load. In this regard, some enquiry will generally need to be made of the customer concerning usage of plant.

If determination of the existing demand by measurement is not feasible, information on the existing connected load is to be obtained. The assessment is then to be carried out as for a new installation in accordance with Clause 2.3.

Any load information already obtained by a Service Marker, or other officer should, as far as practicable, be used.

TABLE 1 - DIVERSITY FACTORS

(Metering of Three Phase Supply)

Type of Load	Commercial & Industrial Premises	Other Premises (Incl. Domestic)
Lighting * See Note 1	1	0.7
GPOs or plug sockets (No. x rating) (Premises with permanently installed heating or cooling)	0.04 (1st 50) 0.03 (beyond 1st 50)	0.04 (1st 50) 0.03 (beyond 1st 50)
GPOs or plug sockets (No. x rating) (Premises without permanently installed heating or cooling)	0.3 (1st 50) 0.2 (beyond 1st 50)	0.15 (1st 50) 0.1 (beyond 1st 50)
Cooking, water heating, kilns, saunas (Excluding boilers, furnaces and instantaneous water heaters)	0.7	0.5
Instantaneous water heaters, hand-dryers	0.3	0.3
Heating, continuous - (Bar radiators, spas, pool heating)	1	1
Space heating, air-conditioning reheating	0.7	0.5
Air conditioning, ventilation - (Compressors, fans pumps)	0.8	0.8
Refrigeration	0.7	0.5
Motors - (General)	0.5	0.3
Motors - (Large compared with rest of installation)	0.9	0.9
Lifts, escalators, water pumps	0.3	0.3
Conveyor or process systems	0.5	0.5
Battery charging installation (used during normal working hours)	0.8	0.8
Motor - Generator welders (Rated primary current)	0.7	0.7
Plastic moulding machines	0.7	0.7
Roller shutters, fire pumps, X-ray machines and equipment not in use at time of maximum demand	Neglect	Neglect
Off-peak controlled loads	1	1
Continuous loads which cannot be diversified	1	1

See over for notes.

* Notes:

1. For lighting tracks allow 0.5A per phase per m length.

2. For equipment not covered in the above Table, further information should be sought from the customer.

3. These diversity factors may be varied to take into account known usage of customer's equipment.

4. Although fire pump loads are neglected in assessing the maximum demand of a portion of an installation, the starting current of the pump is to be taken into acount when determining whether the size of the proposed fuse protecting the meter is adequate. The officer should refer the matter to the supervisor for resolution by the engineering staff, where the sum of the assessed demand and the pump's starting current exceeds 200% of the fuse rating. The starting current is to be assumed to be 6 times the full-load current.

TABLE 2 - MAXIMUM DEMAND OF MULTIPLE DOMESTIC PREMISES

Number of Units or Houses	Types of Units and Load in A per Phase Balanced over Three Phases	
	Gas/ Electric Units	Small All Electric Units
3	16	24
6	27	46
9	36	62
12	44	75
15	50	83
18	56	89
21	64	108
24	72	120
27	78	131
30	83	141
33	91	150
36	97	160
39	105	172
42	110	182
45	115	195
48	121	202
51	128	215
54	132	222
57	140	230
60	145	240
63	150	250
66	156	260
69	160	267
72	166	277
75	172	287
78	177	295
81	182	305
84	187	315
87	194	322
90	198	332
93	205	340
96	210	350
99	215	360
102	220	367
105	225	377
108	230	387
111	235	395
114	240	405
117	245	413
120	250	422
123	256	431
126	262	440
129	267	448
132	273	457
135	280	465

Where the number of units exceeds that tabulated the following values may be used:

a. gas/electric units 2.0A per phase per unit
b. small all electric units 3.5A per phase per unit

4. FULL-LOAD CURRENT

In calculating maximum demands, it will be necessary to convert the rating of equipment to full-load current in amperes before applying diversity factors. Reference should be made to Table 3 for conversion factors.

TABLE 3

Type of Load	Three Phase	Single Phase
Heating or lighting	1.3A per phase/kW	4.0A/kW
Motors - Up to 1kW	2.7A per phase/kW	8.0A/kW
- Up to 15kW	2.0A per phase/kW	6.0A/kW
- Over 15kW	1.7A per phase/kW	-
- Up to 1 HP	2.0A per phase/HP	6.0A/HP
- Up to 20 HP	1.5A per phase/HP	4.5A/HP
- Over 20 HP	1.3A per phase/HP	-
Room air conditioners Up to 3kW or 4 HP	3.0A per phase/kW of compressor motor rating 2.3A per phase/HP of compressor motor rating	9.0A/kW of compressor motor rating 7.0A/HPof compressor motor rating

Note: Room air conditioners rated above 3kW or 4 HP are treated as for motors in determining full-load current.

5. SAA WIRING RULE 2.6

2.6 CALCULATION OF MAXIMUM DEMAND IN CONSUMERS MAINS AND SUBMAINS.

2.6.1 Basis of calculation.

2.6.1.1 General. The maximum demand shall be calculated in accordance with Clauses 2.6.2 to 2.6.4 for the appropriate type of installation and equipment supplied.

For the purpose of this calculation the load connected to each active conductor shall be treated separately.

2.6.1.2 Special consideration. *It is recognized that there may be considerable differences in loading from one installation to another including those covered in Tables 2.3 and 2.4 and others such as churches, public halls, schools, recreational reserves and retirement centres. While some aspects of Clause 2.6 and Tables 2.3 and 2.4 may be used as a guide, the maximum demand of these installations should be the subject of special consideration by the Inspecting Authority after discussion with the parties concerned having regard to all the relevant information available.*

2.6.1.3 Mixed domestic and non-domestic portions. Where an installation is comprised of loads from both domestic and non-domestic portions, the maximum demand shall be obtained by adding together the relevant calculated values from Tables 2.3 and 2.4.

2.6.2 Single and multiple domestic installations. For single and multiple domestic installations, calculation of the maximum demand of each phase of the installation shall be determined from Table 2.3 by taking the sum of the values obtained by applying the instructions under column 2, 3, 4 or 5, as appropriate, to the load groups A, B, etc, under column 1.

NOTE: Examples of the calculation of maximum demand for single and multiple domestic installations using Table 2.3 are given in Appendix G.

2.6.3 Non-domestic installations. For non-domestic installations, calculation of the maximum demand of each phase of the installation shall be determined from Table 2.4 by taking the sum of values obtained by applying the appropriate instructions under columns 2 and 3 according to the type of installation, to the load groups A, B, etc, under column 1.

2.6.4 Welding machines.

2.6.4.1 Definitions. For the purpose of Clause 2.6.4, the following definitions apply:

(a) Rated primary current—

  (i) the marked rated input current, for arc welding machines complying with AS 1966; or

  (ii) the current obtained by multiplying the rated kilovolt amperes (kV.A) by 1000 and dividing by the rated primary voltage using the values given on the nameplate, for all other welding machines.

(b) Actual primary current—the current drawn from the supply circuit during each welder operation at the particular heat tap and control setting used.

COPYRIGHT

5. SAA WIRING RULE 2.6 (Cont'd)

(c) **Duty cycle—the ratio of the time during which welding current flows to the standard period of 1 min, expressed as a percentage.**

Example 1: A spot welder supplied by a 50 Hz system (3000 cycles/min) making six 15-cycle welds per minute would have a duty cycle of—

$$\frac{6 \times 15 \times 100}{3000} = 3 \text{ percent}$$

Example 2: A seam welder operating 2 cycles 'on' and 2 cycles 'off' would have a duty cycle of 50 percent.

NOTE: The current-carrying capacity of the supply conductors necessary to limit the voltage drop to a value permissible for the satisfactory performance of welding machines, may sometimes be greater than that required to prevent overheating of the conductors.

2.6.4.2 Arc welding machines.

(a) ***Individual machine.*** *The maximum demand of an individual arc welding machine shall be deemed to be 100 percent of the rated primary current.*

(b) ***Groups of machines.*** *The maximum demand of two or more arc welding machines shall be deemed to be as follows:*

- *(i) two largest welding machines . . . 100 percent of each rated primary current; plus*
- *(ii) next largest welding machine . . . 85 percent of the rated primary current; plus*
- *(iii) next largest welding machine . . . 70 percent of the rated primary current; plus*
- *(iv) all other welding machines . . . 60 percent of the rated primary current.*

2.6.4.3 Resistance welding machines.

(a) ***Individual machines.*** *The maximum demand for individual welding machines shall be deemed to be as follows:*

- *(i) Varying operation . . . 70 percent of the rated primary current for seam and automatically fed machines, and 50 percent of the rated primary current for manually operated, non-automatic machines.*
- *(ii) Specific operation . . . the product of the actual primary current and the multiplier given below for the duty cycle at which the welder will be operated under specific operating conditions for which the actual primary current and duty cycle are known and remain unchanged.*

Duty cycle (percent):	*50*	*40*	*30*	*25*	*20*	*15*	*10*	*7.5*	*5.0 or less*
Multiplier:	*0.71*	*0.63*	*0.55*	*0.50*	*0.45*	*0.39*	*0.32*	*0.27*	*0.22*

(b) ***Groups of machines.*** *The demand for two or more resistance welding machines shall be deemed to be the sum of the values obtained in accordance with (a) of this clause for the largest welding machine supplied, and 60 percent of the values obtained in accordance with (a) of this clause for all other welding machines supplied.*

COPYRIGHT

5. SAA WIRING RULE 2.6 (Cont'd)

FOOTNOTES TO TABLE 2.3:

a For multiphase connections, divide the number of living units by number of supply phases, e.g. 16 units on a three-phase supply, 16/3 = 6 units on the heaviest loaded phase (column 4).

b Where only a portion of the number of units in a multiple installation is equipped with permanently connected or fixed appliances, such as electric cooking ranges or space heating equipment, the number of appliances in each category is divided over the number of phases, and the maximum demand determined as shown in Example 3 of Appendix G.

c Lighting track systems shall be regarded as 2 points per metre of track.

d This load group is not applicable to socket-outlets installed in communal areas but connected to the individual living units. Such socket-outlets should be included in load group B.

e For the purpose of determining maximum demand, a multiple combination socket-outlet shall be regarded as the same number of points as the number of integral socket-outlets in the combination.

f Where an installation contains 15 A or 20 A socket-outlets covered by load group B(ii) or B(iii), the base loading of load group B(i) is increased by 10 A or 15 A respectively; if both 15 A and 20 A socket-outlets are installed, the increase is 15 A.

g Where an installation includes an airconditioning system for use in hot weather and a heating system for use in cool weather, only that system which has the greater load shall be taken into account.

h Flood lighting, swimming pool lighting, tennis court lighting and the like.

j Instantaneous water heaters including 'quick recovery' heaters having element ratings greater than 100 W/L.

k Continuous water heaters are taken to include storage type water heaters, including 'quick recovery' heaters not referred to in footnote *j* above, but excluding 'off-peak' water heaters referred to in footnote *l* below.

l Off-peak loading is taken to include only loading to which supply is available for a period of time between the hours of 8.00 p.m. and 8.00 a.m. local standard time.

m In the calculation of the connected load,the following ratings shall be assigned to lighting:

(i)	Incandescent lamps . . .	60 W or the actual wattage of the lamp to be installed, whichever is the greater, except that if the design of the luminaire associated with the lampholder permits only lamps of less than 60 W to be inserted in any lampholder, the connected load of that lampholder shall be the wattage of the highest rated lamp which may be accommodated. For multi-lamp luminaires, the load for each lampholder shall be assessed on the above basis.
(ii)	Fluorescent and other discharge lamps . . .	Full connected load, i.e. the actual current consumed by the lighting arrangement having regard to auxiliary equipment such as ballasts and capacitors.
(iii)	Lighting tracks . . .	0.5 A/m per phase of track or the actual connected load, whichever is the greater.

n A socket-outlet installed more than 2.3 m above a floor for the connection of an appliance rated at not more than 100 W or a luminaire may be included as a lighting point in load group A(i).

p Each item of permanently connected equipment not exceeding 10 A may be included in load group B(i) as an additional point.

COPYRIGHT

5. SAA WIRING RULE 2.6 (Cont'd)

TABLE 2.3

MAXIMUM DEMAND—SINGLE AND MULTIPLE DOMESTIC INSTALLATIONS

1	2	3	4	5
Load group	Single domestic installation or individual living unit per phase	Blocks of living units [a,b]		
		2 to 5 living units per phase	6 to 20 living units per phase	21 or more living units per phase
		Loading associated with individual units		
A. Lighting (i) Except as in (ii) and load group J below [c]	3 A for 1 to 20 points + 2 A for each additional 20 points or part thereof	6 A	5 A + 0.25 A per living unit	0.5 A per living unit
(ii) Outdoor lighting exceeding 1000 W [h,m]	75% connected load	No assessment for the purpose of maximum demand		
B. (i) GPOs and socket-outlets not exceeding 10 A [e,n] Permanently connected equipment not exceeding 10 A and not included in other load groups [p]	10 A for 1 to 20 points + 5 A for each additional 20 points or part thereof	10 A + 5 A per living unit	15 A + 3.75 A per living unit	50 A + 1.9 A per living unit
(ii) Where the installation includes one or more 15 A socket-outlets other than socket-outlets provided to supply equipment set out in C, D, E, F, G, H and N [e,f]	10 A	10 A	10 A	10 A
(iii) Where the installation includes one or more 20 A socket-outlets other than socket-outlets provided to supply equipment set out in C, D, E, F, G, H and N [e,f]	15 A	15 A	15 A	15 A
C. Ranges, cooking appliances, laundry equipment or socket-outlets rated at more than 10 A for the connection thereof [e]	50% connected load	15 A	2.8 A per living unit	2.8 A per living unit
D. Fixed space heating or air-conditioning equipment, saunas or socket-outlets rated at more than 10 A for the connection thereof [e,g]	75% connected load	75% connected load	75% connected load	75% connected load
E. Instantaneous water heaters [i]	33.3% connected load	6 A per living unit	6 A per living unit	100 A + 0.8 A per living unit
F. Continuous water heaters including quick recovery [k]	Full-load current	6 A per living unit	6 A per living unit	100 A + 0.8 A per living unit
G. Off-peak water heaters and off-peak room heating elements. Off-peak spa and swimming pool heaters [l]	33.3% connected load	Where the full-load current is less than the figure obtained under the other items, it shall be ignored in making the calculation.		
	If all or portion of the off-peak load is subject to change-over switch or other forms of control permitting supply at other than 'off-peak' hours, such loading shall be included under group D or F, as appropriate.			
	Where the full-load current of the off-peak loading exceeds the figure calculated under other items of the appropriate column, such off-peak loading together with loading calculated under group A(ii) and group J below, shall be taken as the maximum demand for the installation.			
H. Spa and swimming pool heaters	75% of the largest spa, plus 75% of the largest swimming pool, plus 25% of the remainder.			
		LOADING NOT ASSOCIATED WITH INDIVIDUAL UNITS—CONNECTED TO EACH PHASE (PUBLIC LIGHTING, COMMUNITY LAUNDRY LOADINGS, LIFTS, MOTORS ETC)		
J. Communal lighting [h,m]	Not applicable	Full connected load	Full connected load	Full connected load
K. GPOs and socket-outlets not included in groups L and P below [d,e,f] Permanently connected equipment not exceeding 10 A	Not applicable	2 A per point	2 A per point	1 A per point
L. Appliances rated at more than 10 A and socket-outlets for the connection thereof. (i) Clothes dryers, water heaters, self-heating washing machines, wash boilers [e]	Not applicable	50% connected load	50% connected load	50% connected load
(ii) Fixed space heating, air-conditioning equipment, saunas [g]	Not applicable	75% connected load	75% connected load	75% connected load
(iii) Spa and swimming pool heaters	Not applicable	75% of the largest spa plus 75% of the largest swimming pool, plus 25% of the remainder.		
M. Lifts	In accordance with Clause 2.6.3, Table 2.4	No assessment for purpose of calculation of maximum demand. In accordance with Clause 2.6.3, Table 2.4, for determination of size of submains.		
N. Motors	In accordance with Clause 2.6.3, Table 2.4, Column 2	In accordance with Clause 2.6.3, Table 2.4, Column 2.		
P. Appliances, including socket-outlets other than those set out in groups A to N above, e.g. pottery kilns, welding machines, radio transmitters, X-ray equipment and the like.	Connected load 5 A or less: No assessment for purpose of maximum demand.	Connected load 10 A or less. No assessment for purpose of maximum demand.		
	Connected load over 5 A: Full details to be submitted to the Inspecting Authority who will assess the demand.	Connected load over 10 A. Full details to be submitted to the Inspecting Authority who will assess the demand.		

FOOTNOTES: See page 49.

Doc. 3000 - Reprinted with the permission of SAA.

5. SAA WIRING RULE 2.6 (Cont'd)

COPYRIGHT
COPYRIGHT

TABLE 2.4
MAXIMUM DEMAND—NON-DOMESTIC INSTALLATIONS

1	2	3
Load group	**Residential institutions, hotels, boarding houses, hospitals, accommodation houses, motels[e]**	**Factories, shops, stores, offices, business premises[e]**
A. Lighting other than in load group F[a]	75% connected load	Full connected load
B. (i) GPOs other than those in B(ii)[d]	1000 W for first outlet plus 400 W for each additional outlet	1000 W for first outlet plus 750 W for each additional outlet
B. (ii) GPOs in buildings or portions of buildings provided with permanently installed heating and/or cooling equipment[b,d]	1000 W for first outlet plus 100 W for each additional outlet	1000 W for first outlet plus 100 W for each additional outlet
B. (iii) Socket-outlets other than GPOs[d]	Full current rating of highest rated socket-outlet plus 50% of full current rating of remainder	Full current rating of highest rated socket-outlet plus 75% of full current rating of remainder
C. Appliances for cooking, heating and cooling, including instantaneous water heaters, but not appliances included in groups D and J below	Full connected load of highest rated appliance plus 50% of full load of remainder	Full connected load of highest rated appliance plus 75% of full load of remainder
D. Motors other than in groups E and F below	Full load of highest rated motor plus 50% of full load of remainder	Full load of highest rated motor plus 75% of full load of second motor plus 50% of full load of remainder
E. Lifts	(i) Largest lift motor—125% full-load current (ii) Next largest lift motor—75% full-load current (iii) Remaining motors—50% full-load current For the purpose of this Load Group, the full-load current of a lift motor shall mean the current taken from the supply when lifting maximum rated load at maximum rated speed	
F. Fuel dispensing units	(i) Motors: First motor—full load Second motor—50% full load Additional motors—25% full load (ii) Lighting—full connected load	
G. Swimming pools, spas, saunas, thermal storage heaters including water heaters, space heaters, and similar arrangements[c]	(i) Continuous elements—full-load current in all cases (ii) Off-peak elements (including off-peak elements which may be connected to the supply at other than off-peak times by means of a change-over switch or load control systems): 66.6% of full-load current where the demand of the rest of the installation as calculated is not less than that of the off-peak element. Full-load current in all other cases	
H. Welding machines	In accordance with Clause 2.6.4, taking into account power factor correction	
J. X-ray equipment	50% of the full-load current of the largest X-ray unit, additional units being ignored	
K. Other equipment not covered by load groups above	By assessment of the Inspecting Authority	

FOOTNOTES TO TABLE 2.4:

[a] In the calculation of the connected load, the following ratings shall be assigned to lighting:

(i) Incandescent lamps	60 W or the actual wattage of the lamp to be installed, whichever is the greater, except that if the design of the luminaire associated with the lampholder permits only lamps of less than 60 W to be inserted in any lampholder, the connected load of that lampholder shall be the wattage of the highest rated lamp which may be accommodated. For multi-lamp luminaires, the load for each lampholder shall be assessed on the above basis.
(ii) Fluorescent lamps	Full connected load, i.e. the actual current consumed by the lighting arrangement having regard to auxiliary equipment such as ballasts and capacitors.
(iii) Lighting tracks	0.5 A/m per phase of track or the actual connected load, whichever is the greater.

[b] Load group B(ii) applies to buildings or portions of buildings incorporating permanently installed heating and/or cooling equipment specifically provided to render unnecessary the use of general purpose outlets for portable electric space heating or cooling appliances. Whether heating or cooling or both is deemed necessary to avoid the use of portable heating or cooling equipment will depend on the location and climate involved.

[c] Off-peak loading is taken to include only loading to which supply is available for a period of time between the hours of 8.00 p.m. and 8.00 a.m. local standard time.

[d] A socket-outlet installed more than 2.3 m above a floor for the connection of an appliance rated at not more than 100 W or a luminaire may be included as a lighting point in load group A.

[e] See Clauses 2.5(ii) and 2.9.3 for where the maximum demand for consumers mains and submains, and final subcircuits respectively may be determined by limitation.

Doc. 3000 - Reprinted with the permission of SAA.

6. SAA WIRING RULES (Appendix G)

APPENDIX G

EXAMPLES OF APPLICATIONS OF VARIOUS PROVISIONS OF THIS STANDARD

G1 GENERAL. The examples in this Appendix are provided as a guide to the application of various provisions of this standard.

G2 EXAMPLES.

G2.1 Calculation of maximum demand in single and multiple domestic installations (Clause 2.6 and Table 2.3).

Example 1. Determine the maximum demand of a single domestic installation supplied by single-phase 240 V with the following load:

24 lighting points
10 m of lighting track
9 single outlet GPOs
8 double outlet GPOs
One 50 W exhaust fan
One 1000 W strip heater
One 15 A socket-outlet
One 10 kW range
One 1.5 kW off-peak water heater
One 3 kW tennis court lighting.

Solution. The method of determining demand in accordance with Table 2.3—

Load Group A(i)

24 lighting points plus
10 m of lighting track = 44 points
= 3 + 2 + 2 = 7 A

Load Group A(ii)

3000 W tennis court lighting = 12.5 × 0.75 = 9.4 A

Load Group B(i)

9 single outlet GPOs plus
8 double outlet GPOs = 25 points
50 W exhaust fan = 1 point
1000 W strip heater = 1 point
= 10 + 5 = 15 A

Load Group B(ii)

15 A socket-outlet = 10 A

Load Group C
10 000 W range = 41.67 × 0.5 = 20.8 A

Load Group G
Off-peak water heater 1500 W = 6.25 × 0.333 = 2.1 A

COPYRIGHT

6. SAA WIRING RULES (Appendix G) (Cont'd)

Total demand

= Sum of load group demands = A(i) + A(ii) + B(i) + B(ii) + C + G
= 7 + 9.4 + 15 + 10 + 20.8 + 2.1
= 64.3 A

Example 2. Determine the maximum demand of the heaviest loaded phase in a domestic installation comprising—

26 lighting points
24 GPOs
15 A socket-outlet
16.6 kW range
4 kW airconditioning unit
12.96 kW instantaneous water heater
3.6 kW clothes dryer

and arrange for connection across a three-phase supply as follows:

Red	*White*	*Blue*
		26 lights
	15 GPOs	9 GPOs
15 A socket-outlet		
5 kW hotplates	5 kW hotplates	6.6 kW oven
4 kW air conditioner		
4.32 kW instantaneous water heater	4.32 kW instantaneous water heater	4.32 kW instantaneous water heater
	3.6 kW clothes dryer	

Solution. The method of determining the demand in the heaviest loaded phase in accordance with Table 2.3 assuming that the installation is balanced as far as practicable over the three phases, is as follows:

	Load Group	*Column*	*Red* (A)	*White* (A)	*Blue* (A)
Lighting	A(i)	2			5
GPOs	B(i)	2		10	10
15 A socket-outlet	B(ii)	2	10		
Range	C	2	10.4	10.4	13.7
Airconditioner	D	2	12.5		
Water heater	E	2	6	6	6
Clothes dryer	C	2		7.5	
			38.9	33.9	34.7

Total loading, heaviest loaded phase = Red phase, 38.9 A.

Example 3. Determine the maximum demand of the heaviest loaded phase of a block of 80 units comprising the following loads:

Lighting	80 units
GPOs	80 units
Electric ranges	17 units
2.5 kW (10.4 A) permanently connected strip heaters	80 units
Quick recovery water heaters	80 units

COPYRIGHT

6. SAA WIRING RULES (Appendix G) (Cont'd)

Loading not associated with the individual units (Community Services):

House and public area lighting
80 lighting points at 60 W each
20 lighting points at 100 W each
(Total lighting 6.8 kW)
20 GPOs
10 clothes dryers at 3.6 kW
2 lift motors each 12 kW
5.5 kW three-phase pump motor
4 kW three-phase water supply motor

Solution. The method of determining the demand of the heaviest loaded phase, assuming that the installation is balanced as far as practicable over the three phases, in accordance with Table 2.3 is as follows:

Number of units per phase, three-phase supply = 80/3 = 27 units over each of two phases and 26 units on the other phase. The instructions given under column 5 of Table 2.3 would therefore be applicable to the installation other than for the ranges.

The number of electric ranges per phase = 17/3 = 6 over each of two phases and 5 on the other phase. The instructions under column 4 of Table 2.3 would therefore be applicable to the Load Group C, Ranges and Cooking Appliances.

Individual units.

	Load Group	*Column*	
Lighting	A(i)	5	27 × 0.5 = 13.5 A
GPOs	B(i)	5	50 + (27 × 1.9) = 101.3 A
Ranges	C	4	6 × 2.8 = 16.8 A
Permanently connected strip heaters	D	5	27 × 10.4 × 0.75 = 210.6 A
Quick recovery water heaters	F	5	100 + (27 × 0.8) = 121.6 A
		Total units loading for heaviest loaded phase	= 463.8 A

Community Services. The lighting is taken as being evenly balanced over the phases, i.e. $\frac{6800}{3}$ = 2266 W per phase. (Should the lighting load be arranged for connection to one phase, the loading for Load Group J would be 6800 W.)

The 20 GPOs are taken as connected 7 over each of two phases and 6 on the other phase.

The 10 clothes dryers are taken as connected 3 over each of two phases and 4 on the other phase: loading on heaviest loaded phase = 14 400 W.

Motors: 5.5 kW motor = 10.4 A per phase (nameplate rating)
4 kW motor = 8.3 A per phase (nameplate rating)

COPYRIGHT

6. SAA WIRING RULES (Appendix G) (Cont'd)

	Load Group	*Column*		
Lighting	J	5	$\frac{2266}{240}$ =	9.4 A
GPOs	K	5	7×1 =	7.0 A
Clothes dryers	L(i)	5	$0.5\left(\frac{14\,400}{240}\right)$ =	30.0 A
Lifts	M	5	NIL	—
Motors	N	5	$10.4 + (8.3 \times 0.5)$ =	14.6 A
Total community services loading for heaviest loaded phase			=	61.0 A

Total loading for heaviest loaded phase:

= Units loading + community services loading
= 463.8 + 61.0 = 524.8 A.

Doc. 3000 - Reprinted with the permission of SAA.

7. EXAMPLES

(a) Large Residence

Load applied for			Demand A per phase
61 lighting points 50 GPOs 2kW air conditioner 15kW range 6kW oven 2 x 4.8kW QRWH	Allow an assumed demand	=	25

	Rating		Table 3		Table 1		
45kW pool heater	45	x	1.3	x	1	=	58
6kW sauna	6	x	1.3	x	.5	=	4
3kW air conditioner	3	x	3	x	.8	=	7
					Total	=	94

7. EXAMPLES (Cont'd)

(b) Retirement Village

The village consists of 30 residential units, 20 hostel/Motel units and a communal area.

As there is a mixture of unit types, it will be necessary to determine from the appropriate table, the demand for the total number of units and then proportion the effect of the demand of each type of unit.

Load applied for			Demand A per phase
30 units (Residential) Each 5 lighting points 4 GPOs 4kW range 3.6kW QRWH	From Table 2 "Small all-electric units", determine demand for 50 units and multiply by $\frac{30}{50}$ $215 \times \frac{30}{50}$	=	129
20 units (Hostel/Motel) Each 3 lighting points 3 GPOs	From Table 2 "Gas/electric units", determine demand for 50 units and multiply by $\frac{20}{50}$ $128 \times \frac{20}{50}$	=	51

Hostel Kitchen and Dining Rooms	Rating		Table 3		Table 1		
30 x 100W lighting points	$\frac{30 \times 100}{1000}$	x	1.3	x	1	=	4
25 GPOs (Air conditioned area)	$\frac{25 \times 10}{3}$	x	-	x	.04	=	3
15kW range	15	x	1.3	x	.5	=	10
10kW oven	10	x	1.3	x	.5	=	7
3HP mixer	3	x	1.5	x	.3	=	1
3 x 15A GPOs (Non-air conditioned area)	$\frac{3 \times 15}{3}$	x	-	x	.15	=	2
5kW air conditioner	5	x	2	x	.8	=	8
					Total	=	215

7. EXAMPLES (Cont'd)

(c) Factory

Load applied for	Rating		Table 3		Table 1		Demand A per phase
146 x 60W lighting points	$\frac{146\text{x}60}{1000}$	x	1.3	x	1	=	11
75 GPOs	$50\text{x}\frac{10}{3}$	x	-	x	.3	=	50
	$25\text{x}\frac{10}{3}$	x	-	x	.2	=	17
2x15A-415V GPOs	2x15	x	-	x	.3	=	9
1x20HP motor	20	x	1.5	x	.5	=	15
1x10kVA seam welder	10	x	1.3	x	.5*	=	7
1x5kVA spot welder	5	x	1.3	x	.2*	=	1
1x2kW air conditioner	2	x	3	x	.8	=	5
1x18A instantaneous water heater	18	x	-	x	.3	=	5
					Total	=	120

* Advised by supervisor

(d) Office Building

Load applied for	Rating		Table 3		Table 1		Demand A per phase
200 x 2 x 40W lighting points	$\frac{200\text{x}80}{1000}$	x	1.3	x	1	=	21
100 GPOs	$50\text{x}\frac{10}{3}$	x	-	x	.04	=	7
	$50\text{x}\frac{10}{3}$ 3	x	-	x	.03	=	5
80kW air conditioner	80	x	1.7	x	.8	=	109
30HP of fans	30	x	1.5	x	.8	=	32
2 x 25HP lifts	50	x	1.3	x	.3	=	20
					Total	=	194

7. EXAMPLES (Cont'd)

(e) Existing School

Existing load	Rating		Table 3		Table 1		Demand A per phase
Measured in summer using tong ammeter 30 x 750W strip heaters not in use							35
Existing heaters	30x.75	x	1.3	x	1	=	29
Additional load applied for							
120 x 40W lighting points	120x.04	x	1.3	x	1	=	6
12 x 500W lighting points	12x.5	x	1.3	x	1	=	8
40 GPOs	$40x\frac{10}{3}$	x	-	x	.04	=	5
					Total	=	83

Controlled load

24 x 1.8kW OP space heaters	24x1.8	x	1.3	x	1	= 56A per phase

8. ISSUE

This Instruction replaces Section 10 (in part) of the Metering Instruction Book and is to be inserted in the Meter Installation Technical Instruction Manual, Volume 2.

D K Gray

CHIEF ENGINEER

The Sydney County Council

TECHNICAL INSTRUCTION

Manual **METER INSTALLATION** N° 7332
Volume 2 Date 7/90

Subject **SELECTION OF METERING EQUIPMENT**

This Instruction sets out the method of selecting metering equipment.

CONTENTS

1. SELECTION OF METERING SYSTEM
2. DIRECT-CONNECTED METERS
3. CT METERS
4. SELECTION OF CTs
5. REPLACEMENT OF CTs
6. REVISION
7. ISSUE

1. SELECTION OF METERING SYSTEM

The assessed demand of each separately metered portion of an installation must be calculated as set out in TI 7331.

Where demand is assessed to not exceed 80A per phase, direct-connected metering is to be provided. Where demand for a separately metered portion of an installation is assessed to exceed 100A per phase, CT metering is to be provided.

Where the demand is assessed to exceed 80A per phase but not 100A, the following guidelines should be followed:

- Direct-connected metering is to be installed for domestic customers and customers having no load-growth potential.
- In the case of existing customers, direct-connected metering is to be retained if it is not necessary to carry out any major alterations to the metering.
- In all other cases CT metering is to be installed.

2. DIRECT-CONNECTED METERS

2.1. PLUG-IN METERS

All plug-in meters are rated at 15/100A and are single-phase.

2.2. BOTTOM-CONNECTED SINGLE-PHASE METERS

The ratings of single-phase bottom-connected meters available for installation, together with the loads for which they can be used, are shown in Table 1.

2.3. BOTTOM-CONNECTED POLYPHASE METERS

Polyphase watthour meters are to be installed only in the circumstances outlined in the publication EI 19 or where it is necessary to eliminate negative meter readings and there is no practical alternative. (Negative readings may occur where there are highly inductive 415V single-phase loads such as welders.) A polyphase meter should not be installed unless a negative reading has actually occurred over a whole meter-reading period.

All polyphase meters in use are bottom-connected. The ratings available together with loads for which they can be used are shown in Table 2.

TABLE 1 - Bottom-Connected Single-phase Meters For Direct-Connected Metering

METER RATING A	ASSESSED DEMANDS FOR WHICH METER IS SUITABLE
10/40*	Steady loads up to 30A
10/60	Single-domestic loads up to 60A. Other loads up to 50A.
10/70 #	Single-domestic loads up to 70A. Other loads up to 60A.
10/70 (dual register)	Process-heating loads up to 60A (with night usage).
10/80	Single-domestic loads up to 80A. Other loads up to 70A.
15/100	Single-domestic loads up to 100A. Other loads up to 90A.
15/100@ +30A off-peak	Domestic loads up to 100A single phase installations and up to 4.8kW off-peak.
20/100	Non-domestic loads up to 90A.
25/125	Non-domestic loads up to 100A.

* Steady loads include off-peak water heaters.

# L & G CL 10/70A meters are to be used only where there is a space problem on an existing board.

@ Nilsen EMS 2000 series plug-in or bottom connected.

TABLE 2 - Polyphase Meters For Direct-Connected Metering

METER RATING A	ASSESSED DEMANDS FOR WHICH METER IS SUITABLE
10/40	Single-domestic loads up to 40A. Other loads up to 30A.
10/40 (dual register)	Process-heating loads up to 30A (with night usage)
15/45	Single-domestic loads up to 45A. Other loads up to 35A.
10/60	Single-domestic loads up to 60A. Other loads up to 50A.
15/100 (dual register)	Process-heating loads up to 90A (with night usage).

3. CT METERS

All CT meters are bottom-connected.

3.1. WATTHOUR METERS

In the normal case, it is not necessary to specify the rating of the CT meter required (except as provided below) as they are all 2.5/15A.

However, where a dual register meter is required, it is necessary to ensure that a 2.5/15A is specified if extended-range CTs are installed. 2.5/10A dual-register meters are also available, but may be used only with multi-range CTs.

Polyphase meters are to be installed only in the same circumstances as set out in Clause 2.3 for direct-connected meters. Where extended-range CTs are installed a 2.5/15A meter must be specified. 2.5/10A polyphase meters are also available, but may be used only with multi-range CTs.

3.2. ENERGY-DEMAND METERS

Energy-demand meters are allocated by the Manager - Metering Policy, Distribution Policy Branch who will need to be advised of the -

- type of CT (and tap in the case of multi-range CTs), and
- assessed or measured maximum demand, using form CSS610 for demand meters and form CSS926 for summation metering.

4. SELECTION OF CTs

For optimum metering accuracy the rating of CTs should match assessed loads. The standard types of CTs available are shown in drawing No. EI 111, which forms part of publication EI 18.

Extended-range CTs (Types S, T, U and V) are designed to give metering accuracy over a wide range of loads. However, in selecting CTs it is also necessary to have in mind the need to use stocks of the older multi-range Types A, B and C. Staff will be given directions in this regard from time to time. In addition, the physical size of the customer's cables or busbars may limit the choice of CT.

Table 3 sets out the CTs which may be used for the assessed maximum demands listed.

The maximum route length of current-circuit conductors (where not subject to the special limitations set out in Table 4) are as set out in Table 2 of publication EI 18. In any case where it is proposed that these lengths be exceeded or that any instrument (other than the meters) be connected in the circuit, the matter should be referred, with full details including expected maximum demand, to the Manager - Metering Policy, for approval.

In selecting CTs expected future increases in load should also be taken into account with a view to avoiding the need to change CTs when such increases occur.

TABLE 3 - CTs Suitable For Various Assessed Maximum Demands

ASSESSED MAXIMUM DEMAND A	CTs	
	EXTENDED-RANGE	MULTI-RANGE (AND TAP)
Up to 200	* S	A (150/5)
201 to 400	* S	A (300/5)
		or B (400/5)
401 to 800	* T	A (600/5)#
		or B (800/5)#
801 to 1200	* T	B (800/5)#
1201 to 1400	* T	B (1200/5)#
		or C (1000/5)
1401 to 2200	U	C (2000/5)
2201 to 3000	U	C (3000/5)
3001 to 5000	U	-
4001 to 6000	V	-

# See Table 4 for special limitations on route-length of current-circuit wiring.

* SCC and ANI Energy Control manufactured.

TABLE 4 - Special Limitations On Route Length Of Current-Circuit Wiring

LENGTH m		Cross-sectional area sq mm
A(600/5)	B(800/5, 1200/5)	
12	24	4
18	36	6
30	60	10

5. REPLACEMENT OF CTs

CTs must be replaced (or tap changed) whenever the maximum load exceeds on a sustained basis, the figures set out in Table 5.

All other types of CTs are to be regarded as obsolete. Obsolete CTs must be replaced (or tap changed) if the maximum load exceeds the nominal primary rating. Obsolete CTs should be replaced regardless of the load whenever a reasonable opportunity is presented.

The Manager - Metering Policy should be advised of any situations where CTs are subject to high ambient temperatures, so that possible derating may be considered.

TABLE 5 - Maximum Loads On CTs

CTs		MAXIMUM LOAD A
TYPE	RATIO	
A	150/5	360
	300/5	700
	600/5	1350
B	400/5	1000
	800/5	2000
	1200/5	2800
C	1000/5	1750
	2000/5	3000
	3000/5	3750
*S	200/5	500#
*T	800/5	1600#
U	2000/5	5000
V	4000/5	6000

# This "maximum load" should not be exceeded by short-term or intermittent loads (excluding motor-starting currents and other loads of very brief duration).

Where the maximum continuous current rating of the meter is less than 15A, the secondary current is not to exceed the rating of the meter.

* SCC and ANI Energy Control manufactured.

In the case of demand metering, if it is found that there has been a significant and sustained reduction in maximum demand such that the CTs (or tapping) are no longer suitable for the load, the CTs are to be replaced (or tap changed).

If it is found that the maximum demand has fallen below 80A per phase and a significant portion of the energy is being consumed at loads of less than 10A per phase and enquiries made of the occupier of the metered premises verify that the reduction in load is permanent, arrangements should be made to replace CT metering with direct-connected metering. In case of doubt, the matter should be referred to the Manager - Metering Policy for advice. CT metering should be replaced in any case where the load has fallen permanently below 80A per phase and major alterations are to be carried out to the installation.

6. REVISION

This instruction has been revised to provide information on type V and U CTs manufactured by the Council and type S and T CTs manufactured by ANI Energy Control. Nilsen EMS 2000series meters have been added to Table 1.

7. ISSUE

This issue amends and replaces the Technical Instruction issued under the same title and number, dated November,1986. It is to be inserted in the Meter Installation Technical Instruction Manual, Volume 2.

J. R. Cox

Act. Assistant General Manager- Engineering

The Sydney County Council

INSTRUCTION

Manual Volume METER INSTALLATION

Nº 7333
Date 11/86

Subject MARKING FOR METERING FACILITIES

This Instruction sets out the Council's metering requirements to be conveyed to customers.

CONTENTS

1. GENERAL
2. NOTICE
3. GIVING OF THE NOTICE
4. UNSATISFACTORY METER POSITIONS
5. CHARGES
6. HISTORICAL BUILDINGS AND SPECIAL DEVELOPMENT AREAS
7. LOCATION, ACCESSIBILITY AND PROTECTION OF SERVICE EQUIPMENT
8. ACCOMMODATION FOR METERING EQUIPMENT
9. ALTERATIONS AND ADDITIONS TO EXISTING INSTALLATIONS
10. BATTENS
11. CONTROLLED LOADS
12. ARRANGING FOR METERING
13. ISSUE

APPENDIX - NOTICE

1. GENERAL

The Leading Hand Technician (Metering) - hereinafter referred to as "the Technician" - is responsible for marking the mounting and connection of meters and load-control devices associated with a service wherever -

(a) the nominal rating of the service exceeds 100A per phase or is likely to exceed 100A per phase in the forseeable future;

(b) the number of meters and load-control devices exceeds that which can be accommodated on one multiple-installation meter-panel module;

(c) either CT metering or a dual-register meter is required; or

(d) the meters are to be located at more than one location.

Before completing a meter marking, the Technician must ensure he has all necessary information. This includes -

(a) correct identification of the premises;

(b) where appropriate, the existing maximum demand and service details;

(c) the proposed loads to be connected; and

(d) any preference the customer may have with regard to the meter arrangements.

The name and designation of persons supplying information are to be recorded.

All requirements conveyed to customers and their representatives shall be in accordance with this Manual, except where otherwise agreed to or directed by the Technician's supervisor.

In selecting the position for the metering equipment, the customer's wishes are to be given every consideration, always keeping in mind the Council's requirements, and the need to not commit the Council to unnecessary expense.

2. NOTICE

The Technician shall complete four copies of the Notice form (see Appendix) indicating the provisions to be made by the customer.

The first two copies are forwarded with the associated papers to the Customer Supply clerical section. The third copy is retained and the last copy is given to the customer.

The Technician commits the Council in writing in the field and must simply and accurately present any information on the Notice so that it is easily understood.

To assist in conveying the requirements, the Technician shall, where appropriate, leave with the customer's copy of the Notice, attachments such as copies of sketches, and any other relevant information. These shall be referred to in the Notice.

2. NOTICE (Cont'd)

When a job has to be re-marked, the Notice is to be endorsed "Previous notice cancelled".

If the existing metering of a premises is satisfactory, the Technician shall leave a Notice endorsed "SCC equipment in order".

Where the space provided on the Notice is not sufficient, it will be necessary to attach a further memorandum or sketch to each copy.

3. GIVING OF THE NOTICE

Subject to the exceptions listed below, the customer's copy of the Notice should be handed to the customer or left in a secure position such as at the meter board or in the letter box.

Notices shall be given to the Enquiry Clerk for forwarding by mail -

(a) whenever requested by the customer or contractor;

(b) where there is no secure place on the premises to leave the Notice;

(c) where it is proposed to send a letter to the customer or contractor regarding the service arrangements;

(d) where a marking originates from a report by Council staff concerning unsatisfactory existing metering arrangements, except in the case where the customer has been left without supply;

(e) where in the opinion of the Technician merely leaving the Notice would not draw attention to it. In this regard, where a customer is changing to a Demand Tariff the Notice shall not be left.

4. UNSATISFACTORY METER POSITIONS

Existing unsatisfactory meter positions shall be corrected wherever, in the opinion of the Technician or the supervisor, such is warranted due to considerations of safety; risk of damage to Council's equipment; or problems of access.

The Technician shall consider the alternatives of -

(a) correcting the problem, e.g. by removing a hazard or obstruction or providing protection for equipment; or

(b) relocating the meters to a position complying with current standards.

The Technician should seek to come to an agreement with the customer on the course of action to be taken, bearing in mind any charges which may be involved.

4. UNSATISFACTORY METER POSITIONS (Cont'd)

If alternative (a) is to be pursued the Technician is to prepare a report, which will be used as the basis for a letter to the customer. In the case of alternative (b) the Technician shall issue a Notice.

If, in the case of a relocation of meters, it appears to the Technician that it may be necessary to also relocate service mains or fuses, the Notice shall be returned to the supervisor with a report to that effect.

5. CHARGES

The circumstances in which a customer may be required to bear charges in connection with provision of metering are in general as set out in Service Rule 3.2.4. Details of the fixed charges are set out in full in the Clauses of the Recoverable Expenditure Regulations listed below:

Clause	Item
126	Additional service and/or meters
150	Temporary services - builders' services
151	Temporary services - miscellaneous
152	Temporary installations - inspection and metering

Where expenditure is recoverable, the customer is required to complete and sign an offer-to-pay form before the work proceeds. Where possible, the Technician should have the customer complete and sign the form before leaving, otherwise the form should be left with the Notice.

When the customer is a partnership, any partner may sign. In the case of a company, organisation, government body or instrumentality or body corporate, only a duly authorised officer of the organisation may sign but such officer must indicate his position in the organisation. An offer-to-pay form signed by a contractor on his own behalf is acceptable provided he is the party to be charged.

The Technician should indicate the expected cost only where this is a fixed charge or it has been estimated by the Cost Control Officer. In some instances, customers may be unwilling to sign an offer-to-pay unless advised of the estimated cost. In this event, the matter is to be referred to the supervisor who will obtain an estimate.

6. HISTORICAL BUILDINGS AND SPECIAL DEVELOPMENT AREAS

If a building is known or appears to have historical significance, the owner should be consulted before marking, in order to come to some arrangement which will avoid disfigurement of the building.

In the case of supply to properties within the area coming under the control of the Sydney Cove Redevelopment Authority, the oral agreement of a representative of the Authority must be obtained before a Notice is issued.

7. LOCATION, ACCESSIBILITY AND PROTECTION OF SERVICE EQUIPMENT

7.1 General

Service and Installation Rules 3.3 to 3.8 inclusive indicate general requirements for location, accessibility and protection of service equipment. Reference should also be made to Clauses 5.3 and 5.4 of publication E.I. 8 which specify requirements in addition to that set out generally in the above Rules. Reference should also be made to publication E.I. 18 where CT metering is required.

Locations should be avoided where metering equipment is likely to be struck by vehicles or be a hazard due to projecting near head height.

In the case of partially completed buildings, Technicians should check, where it appears necessary, to ensure that the proposed metering-equipment location will not be affected by future partitioning or equipment to be installed.

7.2 Height Requirements

Specific height requirements are indicated on drawings reference Nos. 101 and 112 appended to publications E.I. 8 and E.I. 18 respectively.

7.3 Car Parks and Carports

Wherever practicable, meter positions should be avoided in car parks, carports or other areas where metering equipment would be subject to possible damage or where access may be obstructed by vehicles. If there is no reasonable alternative, meter positions may be marked in such areas, with the requirement that measures be taken to ensure that access is not obstructed and vehicles are prevented from coming closer than 1m from the metering equipment. Suitable measures for achieving this include kerbs and protective rails or posts.

In the latter circumstances, the Technicians shall endorse the Notice:

"If access to service equipment is obstructed in the future, the customer may be required to bear all costs involved in relocating it".

7.4 Overhanging Structures

Where an overhanging structure is being relied upon to provide protection from the weather, any line drawn at 45 degrees to the vertical through the outer edge of the structure must encompass the meter boards and meters.

7.5 Fire-Escape Exits - Ordinance 70

In the case of new buildings, other than single dwelling homes or outbuildings, Ordinance 70 under the Local Government Act places certain restrictions on the installation of electricity meters and ducts in areas required for fire-escape purposes. It should be noted that local Councils may also require existing buildings to be brought up to

7. LOCATION, ACCESSIBILITY AND PROTECTION OF SERVICE EQUIPMENT (Cont'd)

Ordinance 70 standard, particularly where a building is being altered or its use changed. The Technician shall wherever practicable, avoid marking meter positions in such locations. Where there is no practicable alternative, the Technician shall attach to the Notice a printed slip with the following wording:

"Ordinance 70 under the Local Government Act prohibits the installation of electricity meters and ducts in an exit required for fire-escape purposes or any corridor, hallway, lobby or the like leading to such an exit, unless enclosed by a construction which comprises or is lined with non-combustible material or a fire-protective material specified in the Ordinance."

"Required fire-escape exits or paths leading to such exits (other than stairways and ramps) are required to have a minimum unobstructed width of 1020mm and a minimum unobstructed height of 2030mm (2040mm in the case of institutions or places of assembly)".

"It is the customer's responsibility to obtain local Council approval for the installation of the service equipment as proposed. When approval has been obtained, please contact .... The service equipment will be installed following sighting of evidence of local Council approval".

7.6 Hazardous Areas

Meter positions must not be located in "Hazardous Areas" as defined in the SAA Wiring Rules. These are generally areas in which an explosive mixture of combustible gases or dusts can be expected to be present at anytime. Such areas may be found in enclosed car parks, dry-cleaning establishments, paint factories, spray-painting shops and the like. If a Technician believes an area in which it is proposed to locate service equipment may be hazardous, he should refer the matter to the supervisor.

8. ACCOMMODATION FOR METERING EQUIPMENT

Provision for the Council's metering and other associated service equipment for new installations shall be as provided in publications E.I. 7, E.I. 8 and E.I. 18, as appropriate.

In selecting the position for meters care must be taken to comply with requirements regarding clearances from conductors. (Refer to Section 7 of publication E.I. 8.)

Where it is proposed to install CTs in a switchboard enclosure, the Notice is to specify the type of CTs to be provided.

9. ALTERATIONS AND ADDITIONS TO EXISTING INSTALLATIONS

All alterations and additions shall conform with publication E.I. 19.

9. ALTERATIONS AND ADDITIONS TO EXISTING INSTALLATIONS (Cont'd)

9.1 Additional Metering Equipment

Any existing board may continue to be used at an existing or new position if in a sound condition and able to accommodate the required metering equipment.

It is also permissible to use an additional or replacement board at an existing or new position to accommodate additional metering equipment. If the existing board is of the type which would have been provided by the Council, any additional or replacement board will be provided and installed by the Council on battens to be erected by the customer.

9.2 Use of Bottom-Connected or Plug-in Meters

Where bottom-connected metering exists or CT metering is being replaced with direct-connected metering, the Technician shall mark for any additional metering to be single-phase bottom-connected, except where the customer requests plug-in metering, or the use of a polyphase meter is warranted in accordance with the conditions outlined in the publication E.I. 19 and T.I. 7332.

Wherever plug-in metering is to be used, it shall be installed in accordance with publication E.I. 7 or E.I. 8 as applicable.

9.3 Obsolete Equipment

Obsolete service fuses, service neutral links and metering equipment are to be replaced when found. (Refer to TI 7309.)

9.4 Earthing

Where it is found that a MEN system is not installed, the Notice shall call for the earthing to be converted to the MEN system.

9.5 Disconnection and Reconnection At 80A or 100A Termination Box

The 80A termination box will only accommodate conductors up to 16 sq.mm. Where larger cables are to be installed, arrangements should be made for the metering staff to work in conjunction with mains staff to change the box to a 100A type.

10. BATTENS

The length, spacing, fixings and clearances required around battens for meter boards and service cabinets shall be indicated on the Notice. All battens shall be 40mm x 40mm (dressed) finished size.

11. CONTROLLED LOADS

When marking for metering of a swimming-pool installation to be supplied at an off-peak tariff, the Technician is to attach to the Notice a printed slip with the following wording:

"Your local Council may have building regulations which prohibit the use of swimming pool circulating pumps during specified hours and/or, require the installation of 'approved' soundproofing enclosures. To avoid unnecessary inconvenience and cost being borne by yourself, you are advised to seek approval for the proposed installation through your local Council prior to purchasing any equipment, or taking supply for the installation from this Council".

12. ARRANGING FOR METERING

The Technician is to make out a CSS926 form in triplicate nominating the metering work to be carried out, two copies of which are forwarded to the Customer Supply clerical section. Where a Notice has been completed the copies of CSS 926 are to be attached to the Notice copies.

13. ISSUE

This Instruction replaces Section 10 (in part) of the Metering Instruction Book, BSIs 501 (in part), 576 and 585 and forms part of the Meter Installation Technical Instruction Manual, Volume 2.

D K Gray

CHIEF ENGINEER

APPENDIX - NOTICE

Applicant ....

Premises ....

Cross St. ....Service Fuse size ....

PROVISION FOR MOUNTING METERING EQUIPMENT IS REQUIRED AS FOLLOWS:

a) Erect ....fully connected socket bases arranged in accordance with the sketch below and drawings Ref. Nos. E.I. 101 and 102...

....

b) Erect ....CT-metering panel(s) in accordance with the sketch below and section 3 of publication E.I.18. ....

....

c) Erect vertically in accordance with the sketch below —

.... pair(s) of softwood battens 40mm x 40mm (dressed finished dimensions) x .... mm long, with ....mm between outer edges for ....

....

.... pair(s) of softwood battens 40mm x 40mm (dressed finished dimensions) x .... mm long, with .... mm between outer edges for ....

....

d) (other requirements)

....

....

....

NC 3465 (CSS 849) — 11/85

.... DATE ....

The Sydney County Council

TECHNICAL INSTRUCTION

Manual METER INSTALLATION **Nº** 7350
Volume 2 **Date** 5/88

Subject SUPERVISION

This Instruction sets out the general requirements related to the supervision of Technicians (Meter Installation).

CONTENTS

1. INTRODUCTION
2. WHAT IS SUPERVISION?
3. NEW SUPERVISORS
4. FUNCTIONS OF THE SUPERVISOR
5. INDUCTION TRAINING
6. INDUCTION AND THE SUPERVISOR
7. DISCIPLINE
8. ISSUE

1. INTRODUCTION

The purpose of this Instruction is to provide field supervisors with general information on supervision practices and guidelines to assist them to meet the objectives of their Section. Supervision is both an art and a science and supervisors should make every effort to improve their leadership skills.

2. WHAT IS SUPERVISION?

Each supervisor is responsible for seeing that a certain portion of the Council's operations is carried out effectively and efficiently. The manner in which a supervisor achieves this objective will depend to a large extent upon one's personality and ability and the individual characteristics of the employees under supervision.

Supervision entails:

(a) selecting the right person for each job;

(b) arousing in each person an interest in the work and providing training in the correct work methods;

(c) measuring and rating performance to ensure that the training has been fully effective;

(d) administering correction where necessary;

(e) commending whenever praise is merited; and

(f) fitting each person harmoniously into the working group.

Supervision must be carried out patiently and tactfully; so that each person is caused to perform his work skillfully, accurately, intelligently, safely, enthusiastically and completely.

Difficult work problems are referred by the employee to the supervisor for discussion and solution using the supervisor's greater experience and knowledge of the work practices and those Council policies and procedures which relate to the Section's functions.

3. NEW SUPERVISORS

The newly appointed supervisor will require time to become accustomed to the new duties and environment. During this period he will need to rely considerably upon his staff for information and advice, it is essential that the Section's staff are prepared to discuss work practices. Some staff may have had years of experience, and be able to recall many problems which have been solved in the past. They should be encouraged to use their experience to assist in determining the appropriate action. The supervisor's job is to get work done through other people; not to do everything himself.

Let Your Supervisor Know What You are Doing and Why

Because supervision is vital to the enterprise, senior officers must know what supervisory action is taking place. Effective supervision requires the complete backing of these officers, and one of the best ways to retain this endorsement is to keep them informed of the present situation together with any background information.

4. FUNCTIONS OF THE SUPERVISOR

The main functions related to the duties and responsibilities of the job are listed below .

4.1 Planning

The Section for which the supervisor is responsible has a definite purpose - a definite task to perform - and it is up to the supervisor to see that the task is completed. To do so requires planning of the what, why, when, where, who and how the work is to be carried out. It also applies to the supervisor's own job. As the supervisor answers the above questions he is planning the job in logical steps. Remember some obstacles will always appear, i.e. sickness or other non work interferences. Consequently, you will have to allow for a safety factor to take care of these delays.

It may be an indication of poor planning if -

(a) the supervisor is unable to cope with a multitude of tasks;

(b) the Section is unable to meet deadlines or there is a back-log of jobs;

(c) it is a place of conflict and confusion; and

(d) the employees are rushed to the point where quality suffers and the number of accidents is high.

Planning requires knowledge, foresight, judgement and experience. Planning requires that the job be figured out before being tried out.

4.2 Organising

In organising group effort there must be unity of command, simply a person should have only one direct supervisor. Delegation of responsibility by the supervisor, to whatever extent is considered necessary, to subordinates assists in getting the work done.

The assembly of resources at the right time for the job allows work to proceed smoothly. For example is the paper work prepared, is the material available or does it need to be ordered, are vehicles available and to whom are tasks to be allocated?

4.3 Directing

Since part of the supervisor's job is to get things done through other people, individual effectiveness depends on getting one's ideas across to them clearly and in a way that will achieve the desired result. It is up to the supervisor to explain the task clearly and to ascertain whether the employee really does understand what is required.

4.4. Co-ordinating

Co-ordination is the achievement of orderly group effort and unity of action in the pursuit of a common purpose. It must not be confused with co-operation. Persons in a group cannot co-ordinate themselves no matter how much they co-operate. Co-ordination is a concept which applies to a group and not an individual effort. The supervisor should ensure that each part of a particular project is carried out by the right person at the right time so as to minimise delays and problems in meeting the overall objective.

4.5 Controlling

Controlling is a type of inspection activity. A supervisor must know how well his subordinates are performing. You must ascertain whether people have performed as they were directed, and whether the task is being performed in the desired manner. Activities must be planned, resources organised, orders given and jobs co-ordinated before the control activity starts. Control is evaluating progress or performance against standards or plans. The essential steps in any control process are -

(a) the setting up of standards;

(b) the checking and reporting on performance; and

(c) the taking of corrective action when performance does not measure up to standard.

5. INDUCTION TRAINING

Induction of new employees to the Section begins with the formal training of the new employee in the basics of meter installation by the Electrical Installations Branch.

The training programme is designed to settle the technician into employment by dealing with the theory and standard practices of meter installation. Practical training is also given in the field prior to taking up duties.

6. INDUCTION AND THE SUPERVISOR

The induction of the new employee to the work place is the responsibility of the supervisor. Failure to induct new workers properly results in training programmes having little meaning. If the new employee is left to learn the job unaided, he will not become a satisfactory and satisfied employee in an acceptable time span.

Anyone who is changing jobs at the same grade within the organisation or is being promoted needs some kind of induction as they are entering into a new set of work relationships. The supervisor should look upon induction as a golden opportunity to indoctrinate a new employee, to develop positive attitudes and to promote feelings of interest and friendship. Make the first impression a good one this will pave the way for good relationships.

The supervisor should use this learning stage to instil in the new technician a good attitude towards the Council, the Branch or Section, the job and the training necessary to enable the employee to perform his new duties satisfactorily.

The key to successful induction is for the supervisor to put himself in the new employee's place, anticipate the questions he would want answered, the problems he would want resolved and the reception he would expect.

The supervisor's role in the induction procedure can be divided into the following steps:

(a) Put the new employee at ease and show a personal interest.

(b) Enquire about his previous experience and if practicable relate the benefits of such experience to his new position.

(c) Explain the work of the Section and the part the new employee is to play.

(d) Make the employee aware of his obligations and responsibility.

(e) Show the employee around and introduce him to fellow workers.

(f) Provide practical training to support the theory the employee has absorbed.

(g) Place the employee with a competent officer following practical training.

(h) Follow up the employee's progress.

REMEMBER - It is important that the employee feel pleased at having joined your Section.

6.1 Put the Employee at Ease

When the newcomer reports on the first day, the supervisor should greet the employee by name and take the opportunity to show an interest in the person's background, leisure activities and ambitions. This meeting sets the tone for all future contacts with that person.

6.2 Explain the Work of the Section

At this stage the job is what is of greatest interest to the newcomer. If you start talking about other things first, the technician will be wondering about the job and how it fits into all this, instead of paying close attention to what you are saying. After you have talked about the duties, then show how the job fits into the purpose of the Section and how the functions of the Section fit into the organisation as a whole.

Explain the necessary paperwork and how the theory learnt is put into practice in on the job training.

6.3 Employee to be made Aware of Obligations

This is the time to let the technician know what is expected of him in order to remain an employee of the Council, describe the job and go over it in detail, so that the duties and responsibilities are clearly understood. Explain the extent of the employee's authority and nominate the officer to whom the employee should report if it is not to you. Tell the employee also how well the job must be done for satisfactory performance.

Explain the rules of conduct and the requirements of the Section, such as starting and finishing times, the importance of punctuality, lunch periods, smoking rules, reporting sickness and other reasons for non-attendance. The supervisor should use a check list as a memory aid to ensure coverage of each important item. Advise the employee about pay days; how and when the pay docket is distributed.

In telling the new employee of appropriate and acceptable behaviour, the supervisor will find the "we do it" approach goes over better than the "you do it" approach: "This is the way we operate". "This is what is expected of us".

6.4 Show the Employee Around

Take the new employee through the section and point out the washroom, the timeclock, telephones, files, storerooms and other facilities.

Allocate a desk and clothing locker; introduce the newcomer to co-workers and pave the way for ready acceptance into the group. Indicate to each of the co-workers introduced, what the newcomer's duties will be. Also explain briefly the duties of each person to whom the newcomer is introduced.

6.5 Place the Employee with a Competent Officer

The new employee will have been trained in the theory and practice of the work and may have some experience as an appprentice or electrical fitter. The supervisor should start with the employee on the job giving practical training as required. Observing the way the new person does the job will indicate what additional practical training is needed. If the new employee is inexperienced, give practical training and arrange for him to be placed with an experienced technician for a further period of time until he is capable of carrying out the work with a minimum of supervision.

6.6 Follow-up

It is the supervisor's responsibility to stay informed on how the new employee is performing. Observe the newcomer's adjustment to the group; watch work behaviour and ask the other employees about the newcomer.

Observe job performance from time to time; check production and let the individual know whether he is performing his duties satisfactorily or not. Watch response to training and check what additional training may be necessary, or what difficulty the individual may be having that can be cleared up by an explanation.

Correction and training are much more effective at this time than they would be later when improper performance has become a habit or undesirable attitudes have become established.

The supervisor should set aside definite times to talk with the new employee about his personal interest, job interests, and problems. The employee's attitude to the new job, co-workers, the Branch and the Council should be assessed and if he is doing a good job, explain exactly what it is you appreciate. Don't be afraid to correct and criticise the work but not the person. The majority of new employees welcome constructive criticism. Assist in developing positive attitudes. Get to know the individual to find a motivating factor - you want to help the individual solve problems and to get your ideas across.

Although induction is a time consuming activity, it will save time in the end, as it reduces the time otherwise needed for a person to become a satisfactory and satisfied employee.

7. DISCIPLINE

Discipline is an important element in any organisation. Without clearly defined rules and procedures for regulating the behaviour of all employees, the situation could develop into a chaotic situation. Most employees exercise self-discipline in the work environment, however, occasionally discipline may have to be enforced.

In dealing with breaches in discipline, the aim is not necessarily to punish but to correct or eliminate faults and prevent their reoccurrence.

The following guidelines should be adopted when disciplining employees in an interview situation:

(a) Ensure that you have all the facts prior to the interview, facts and hearsay sometimes become intermeshed.

(b) Select a location out of earshot of other employees, saves unnecessary embarrassment - possibly for both parties.

(c) Start with a brief and concise statement of the matter framed as a question to the individual, the person's response may throw new light on the situation.

Ample time should be given for the individual to express his viewpoint, attempts to suppress a response can lead to an argument, frustration and bitterness which could create new conflicts in the future.

(d) Maintain an adult approach and attitude throughout the interview regardless of the other's behaviour, otherwise it could degenerate into name calling and shouting. The release of pent-up emotions seldom leads to a constructive result.

(e) Listen attentively to what is said and assess the facts of the matter in context with its seriousness.

Following the interview, the form of any disciplinary action should be considered in relation to the nature of the matter, the individual concerned and remembering that the goal is to correct and prevent the situation from occurring again.

A review of the results of the interview at a later date is necessary to ensure satisfactory compliance. If the undesirable behaviour or action continues further action is required.

Where action is to be taken beyond an interview by the supervisor, it shall be in accordance with Management Instruction No. 116.1.

8. ISSUE

This is the initial issue of this Instruction which has been prepared for the guidance of Area Branch staff engaged in the supervision of Technicians (Meter Installation). It is to be inserted in the Meter Installation Technical Instruction Manual, Volume 2.

H. Goodrich

ASSISTANT GENERAL MANAGER - ENGINEERING

SYDNEY
COUNTY
COUNCIL

No. E.I. 1

DECEMBER, 1985

Customer Supply Procedures

1. SCOPE.

2. INQUIRIES.

3. APPLICATION FOR SUPPLY TO NEW AND EXISTING INSTALLATIONS.
   3.1 NEW INSTALLATIONS.
   3.2 ALTERATIONS AND ADDITIONS TO EXISTING INSTALLATIONS.

4. PROVISIONS TO BE MADE FOR SERVICE EQUIPMENT.
   4.1 ON-SITE APPOINTMENTS FOR SERVICE AND METER MARKING.
   4.2 NEW INSTALLATIONS.
   4.3 EXISTING INSTALLATIONS.

5. PROGRESSIVE METERING OF LARGE INSTALLATIONS.

6. INSPECTION.

7. INSPECTION APPOINTMENTS.

8. RE-INSPECTION FEES.

9. REFEREREENCE TO INSPECTION REPORTS.

10. SPECIAL ARRANGEMENTS.

11. WORK OUTSIDE NORMAL WORKING HOURS.

12. SEPARATION OF SUPPLY.

13. FURTHER INFORMATION.

14. ISSUE DATE.

SYDNEY
COUNTY
COUNCIL

No. E.I. 1

DECEMBER, 1985

Customer Supply Procedures

1. SCOPE

This publication outlines procedures relating to the connection of new installations and alterations and additions to existing installations. Following these procedures will assist in meeting the reasonable needs of customers, contractors and the Council and avoiding misunderstanding and delay.

2. INQUIRIES

Inquiries concerning the various procedures set out in this publication should be directed to the staff of the Customer Supply and Services Office at the appropriate Area or District Establishment. The locations of the offices and the areas served by them are set out in detail in publication E.I. 2 - "Customer Supply Inquiries". These offices deal with inquiries in general between the hours of 8.10 a.m. and 4.35 p.m. Telephone inquiries may also be made through the Council's main switchboard - 266 0033. The addresses and telephone numbers are as follows:-

OFFICE	GENERAL CUSTOMER SUPPLY INQUIRIES	INSTALLATION OFFICER AND METERING	
Western Area - Bankstown Office, Corner of Willfox Street and Eldridge Road, Bankstown	707 8001	707 8005	
Five Dock District Office, 67 Fairlight Street, Five Dock	713 3201	713 3205	
Northern Area -	SERVICE MAINS	INSTALLATION INSPECTION	METERING
Chatswood Office, 337-355 Mowbray Rd., Chatswood	410 5301	410 5305	410 5353
Hornsby District Office, Bridge Road, near Sherbrook Road, Hornsby	477 8201	477 8205	477 8254

OFFICE	SERVICE MAINS	INSTALLATION INSPECTION	METERING
Eastern Area - 130 Joynton Avenue, Zetland			
Suburban Inquiries	663 9394	663 9301	663 9376
City Inquiries	663 9394	663 9301	663 9468 663 9360
Southern Area - Kogarah Office, 14-18 Montgomery Street,Kogarah	586 5722 586 5723 586 5724	586 5722 586 5723 586 5724	586 5722 586 5723 586 5724
Miranda District Office, 66-74 Karimbla Road, Miranda	526 3403	526 3413	526 3413
Brisbane Water Area Office - 50 Mann Street, Gosford	(043) 25 8537 25 8539	(043) 25 8535	(043) 25 8552
Mackellar Area Office - Dympna Street,Dee Why West	981 9923	981 9919 981 9920	981 9935

3. APPLICATION FOR SUPPLY TO NEW AND EXISTING INSTALLATIONS

3.1 NEW INSTALLATIONS

Where supply is required to a new single domestic premises, an Application For Supply Of Electricity (i.e. Form 1) only is required to be completed and lodged with the Council.

Where supply is required to a new installation other than a new single domestic premises or alterations involve the provision of supply to an additional customer, an Application For Supply and Agreement For Supply form (i.e. Forms 1 and 2) are required to be completed and lodged with the Council.

On receipt of the abovementioned form/s, the Council's officers will check whether any special conditions of supply are applicable and determine what work will be necessary to provide supply. The customer is informed of any security deposit required, special conditions of supply and of any work which the customer must arrange to have carried out before supply can be given.

To avoid unnecessary delay, it is essential that the application and agreement be completed in as much detail as possible, particularly in regard to the type and rating of appliances such as ranges, water heaters, welders, motors, etc. In the case of water heaters, details as to the type, rating, proposed tariff and if of the storage type, the rated hot water delivery are essential.

3.2 ALTERATIONS AND ADDITIONS TO EXISTING INSTALLATIONS

Certain alterations and additions to existing installations are classified as being "minor" and the only notification required by the Council is the lodgement of the Ready for Test Certificate. Guidelines to enable the electrician or contractor to ascertain whether a job falls into this category are set out in Publication E.I. 19 - "Alterations and Additions to Existing Installations".

4. PROVISIONS TO BE MADE FOR SERVICE EQUIPMENT

4.1 ON-SITE APPOINTMENTS FOR SERVICE AND METER MARKING

Requests for an appointment with a Council officer for a meeting on site will not be agreed to unless, in the opinion of the officer dealing with the inquiry, the locations for service and/or metering equipment can only be determined by consultation on site.

Where work on service equipment has to be carried out in conjunction with the contractor's work, arrangements must be made with the appropriate officer at the Customer Supply and Services office.

4.2 NEW INSTALLATIONS

The installation of the consumers mains should be carried out as soon as the building work is sufficiently advanced. When this work, together with provision of facilities for installation of service equipment has been completed, the Council should be notified by letter or by telephoning the Mains Inquiry number at the appropriate Customer Supply and Services Office. The service mains and associated equipment will be installed as soon as practicable after such notification has been received.

4.3 EXISTING INSTALLATIONS

Where new consumers mains have been installed in an existing installation as a result of a request from a Council officer, additional load and/or switchboard alterations, details of the consumers mains shall be notified as ready for connection by Ready for Test Certificate.

5. PROGRESSIVE METERING OF LARGE INSTALLATIONS

In the case of large installations such as office buildings and multiple customer premises, the Metering Section at the appropriate Customer Supply and Services Office should be notified as soon as the building work is sufficiently advanced for the progressive installation of metering equipment.

6. INSPECTION

When the installation is complete and ready for inspection and connection, a Ready for Test Certificate must be lodged with the Council. If the procedure outlined in 3. and 4. above has been followed, the preliminary work (installation of service mains, etc.) will have been arranged before the Ready for Test Certificate is received, thereby minimising delays in final connection. Provided that any security deposit required has been lodged and the Ready for Test Certificate is received at a Customer Supply and Services Office by 11.00 a.m. on one working day, jobs awaiting supply can generally be inspected on the following working day and if satisfactory, the supply will be connected.

Access to inspect the installation should normally be made available between the hours of 8.30 a.m. and 4.00 p.m. on normal working days.

If the whole of the work covered by the Ready for Test Certificate is not completed at the time of inspection, a charge will be made for any further inspection.

Reference should be made to the publication E.I. 3 - "Ready For Test Certificates" for further information in this regard.

Please Note: It should not be assumed that the inspection will always be carried out with the minimum of notice indicated above and contractors should, where possible, allow a longer period.

7. INSPECTION APPOINTMENTS

In the great majority of cases, the normal routine procedure will meet the needs of the customer and must be followed. Occasionally, however, it may be necessary for the contractor to anticipate the completion of the work and to arrange in advance for the inspection to be made, say on the morning or afternoon of a certain day. An example of this would be where an electric range is being installed in place of a gas range and, so that the customer will not be left without means of cooking overnight, the change-over must be done during the morning, followed by inspection and connection of the new range later in the day. In such cases, an appointment may be made several days in advance with officers of the appropriate Customer Supply and Services office.

It should be noted that any such appointment can be made only when all the necessary preliminary matters have been arranged; that is, the service equipment is satisfactory, any necessary security deposit has been lodged, the Ready for Test Certificate has been received by the Council and the installation has been completed or will be completed before the time of the inspection.

Requests for appointments with Installation Inspectors are agreed to only if it can be shown that real necessity for the appointment exists. The contractor's desire to be at the premises when the Inspector calls is not in itself sufficient reason for making an appointment. However, an appointment for this reason may be justified where the work to be inspected is extensive and spread over a large area.

An appointment cannot be made later than 11.30 a.m. on the day prior to the day on which the inspection is required, as the insertion of such an appointment at a particular place and time in the day's work may make it impossible for the Inspector to cover the work allocated for the day.

8. RE-INSPECTION FEES

The Council charges a re-inspection fee with respect to each installation inspection during which defects are found. These re-inspection fees will be charged even though the defects found during a number of separate inspections are finally checked and found to be in order during one final re-inspection or during the inspection of further portions of the installations. The payment of a re-inspection fee is taken as notification that the defects have been rectified.

9. REFERENCE TO INSPECTION REPORTS

Inspection reports are filed under the customer's name and address. To enable any correspondence or re-inspection fee payment to be identified with the correct inspection report, contractors are requested to supply the name of the customer and the address of the premises concerned as well as the number of the inspection report. When only a report number is quoted, delay is likely to occur.

10. SPECIAL ARRANGEMENTS

In those rare cases where, because of break-down or some other unforeseen emergency, normal procedures or appointments are inadequate, it is open to the customer or contractor to telephone the appropriate Customer Supply and Services office to ask that some special arrangement be made. Every endeavour is made to meet such a request, if it is found to be necessary to depart from normal procedure in order to avoid undue hardship.

11. WORK OUTSIDE NORMAL WORKING HOURS

In some circumstances, the Council may agree to a customer's request to carry out certain work outside normal working hours. An agreement to pay the additional cost involved is required to be signed by the customer, and the contractor should arrange to have the necessary documents completed and handed in together at the appropriate Customer Supply and Services office.

12. SEPARATION OF SUPPLY

Sometimes when a contractor divides an existing installation into separate installations serving two or more occupants, one customer is left without supply until an inspection can be made. Contractors are requested to avoid this situation as far as possible and to minimise the time that supply is unavailable.

Where only minor wiring alterations are involved, the contractor may make a temporary connection to give supply to both portions through the existing meter but should do so only after a Ready for Test Certificate setting out full details has been forwarded to the Council. Where the work is more extensive or the provision of a socket base for metering has been called for, the contractor should discuss the matter with an officer at the appropriate Customer Supply and Services office so that special arrangements can be made to avoid an excessive interruption of supply.

13. FURTHER INFORMATION

Other relevant E.I. Series publications are as follows:-

E.I. 2 - "Customer Supply Inquiries".
E.I. 3 - "Ready for Test Certificates".
E.I. 7 - "Provisions for Service Equipment in Single Domestic and Small Installations".
E.I. 8 - "Provisions for Service Equipment in Multiple Installations".
E.I. 18 - "Metering which Requires the Use of Current Transformers".
E.I. 19 - "Alterations and Additions to Existing Installations".

14. ISSUE DATE

This publication dated December, 1985, supersedes that of the same number and title dated August, 1985.

SYDNEY
COUNTY
COUNCIL

No. E.I. 2

MARCH, 1987

Customer Supply Inquiries

Inquiries concerning the provision of supply to customers' installations are dealt with at Customer Supply and Services offices located in the following Council establishments.

Bankstown, Five Dock, Chatswood, Hornsby, Manly, Gosford, Zetland, Oatley and Miranda.

In general, the hours during which inquiries may be made are between 8.10 a.m. and 4.35 p.m.

The localities served from each office are listed on the following pages. The appropriate direct dialling telephone numbers and the location of parking facilities for visitors' vehicles are also given.

TO GAIN THE MAXIMUM ADVANTAGE, CUSTOMERS AND ELECTRICAL CONTRACTORS SHOULD DEAL DIRECTLY WITH THE OFFICE IN THE APPROPRIATE AREA.

A group of officers located at the Electrical Installations Branch Building, corner Link and Epsom Roads, Kensington is also available to deal with general inquiries which are not related to a particular address. Refer to Page 11 for further details.

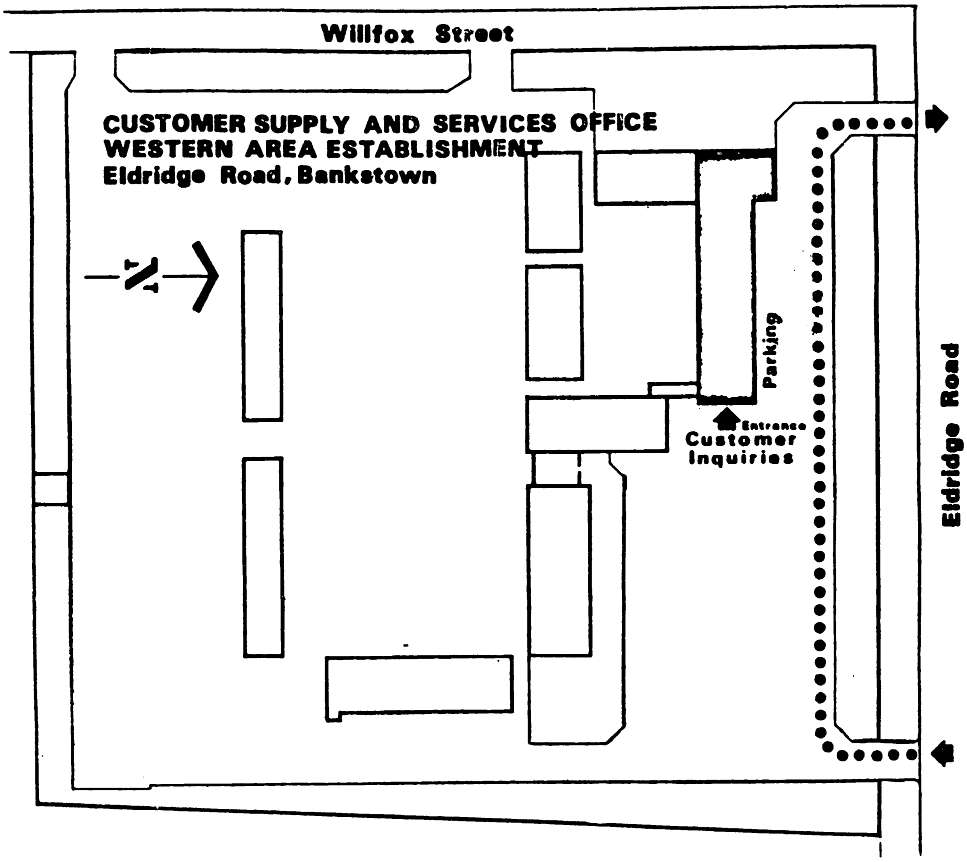
Other relevant E.I. Series publications are as follows:-

E.I. 1 - "Customer Supply Procedures".
E.I. 3 - "Ready for Test Certificates".

This publication supersedes that of the same number issued in November, 1985.

WESTERN AREA OFFICE

On the 1st floor of the Administration Building, Western Area Establishment, corner Willfox Street and Eldridge Road, Bankstown. Vehicle access is from Eldridge Road and visitor parking is available in front of the Administration Building.


Willfox Street
CUSTOMER SUPPLY AND SERVICES OFFICE
WESTERN AREA ESTABLISHMENT
Eldridge Road, Bankstown
Parking
Entrance
Customer Inquiries
Eldridge Road

Telephone Inquiries: General Customer Supply Inquiries - 707 8001
Installation Officer and Metering - 707 8005

Areas Served

MUNICIPALITIES OF AUBURN, BANKSTOWN, CANTERBURY

Comprised of the following localities:-

Ashbury
Auburn

Bankstown
Bass Hill
Belfield (Part)
Belmore
Berala
Beverly Hills (Part)
Birrong

Campsie
Canterbury
Chester Hill
Chullora (Part)
Clemton Park
Condell Park
Croydon Park (Part)

Earlwood
East Hills

Georges Hall
Greenacre
Guildford (Part)

Hurlstone Park

Kingsgrove (Part)

Lakemba
Lansdowne
Leightonfield
Lidcombe

Milperra
Mt. Lewis

Narwee (Part)

Padstow
Panania
Picnic Point
Punchbowl

Regents Park
Revesby
Riverwood
Rookwood

Sefton
Silverwater
Strathfield (Part)
Undercliffe

Villawood

Wiley Park

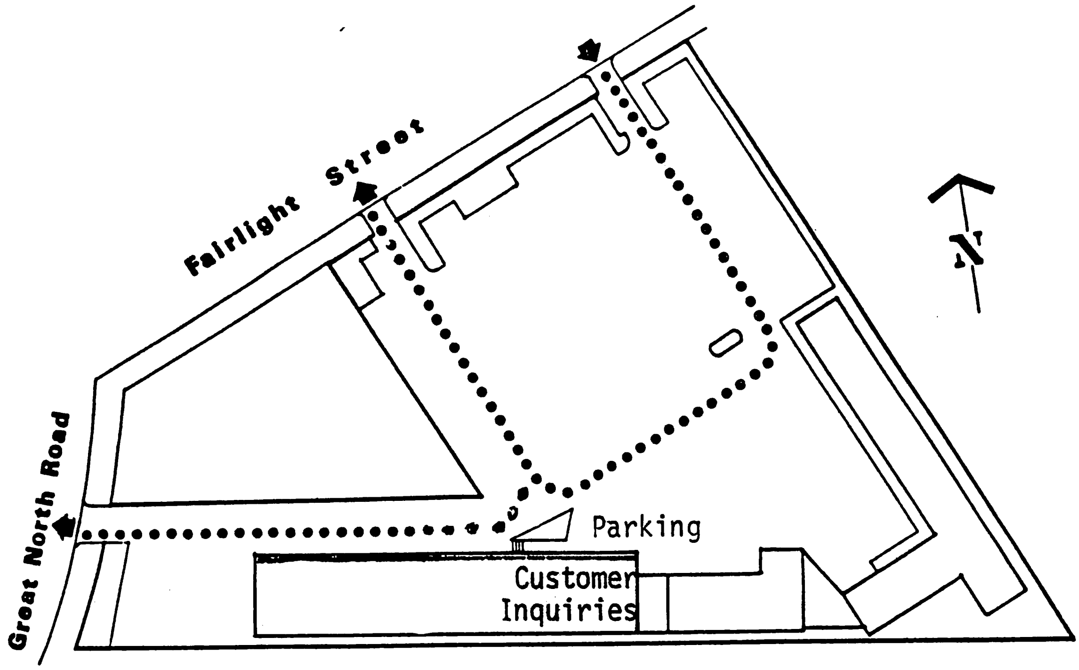
Yagoona

and

Sandy Point
(Sutherland Shire)

FIVE DOCK DISTRICT OFFICE

On the lower ground floor of the Administration Building, Five Dock District Establishment, 67 Fairlight Street, Five Dock. Visitor parking is available in front of the building.



CUSTOMER SUPPLY AND SERVICES OFFICE
FIVEDOCK DISTRICT ESTABLISHMENT
Fairlight Street, Fivedock.

Telephone Inquiries: General Customer Supply Inquiries - 713 3201
Installation Officer and Metering - 713 3205

Areas Served

MUNICIPALITIES OF ASHFIELD, BURWOOD, CONCORD, DRUMMOYNE, LEICHHARDT, MARRICKVILLE, STRATHFIELD.

Comprised of the following localities:-

Abbotsford
Annandale
Ashfield
Balmain
Belfield (Part)
Birchgrove
Burwood

Cabarita
Camperdown (Part)
Chiswick
Chullora (Part)
Concord
Concord West
Croydon
Croydon Park (Part)

Drummoyne
Dulwich Hill

Enfield
Enmore
Erskineville (Part)

Five Dock
Flemington
Forest Lodge

Glebe

Haberfield
Homebush

Leichhardt
Lewisham
Lilyfield

Marrickville
Mortlake

Newtown (Part)
North Strathfield

Petersham

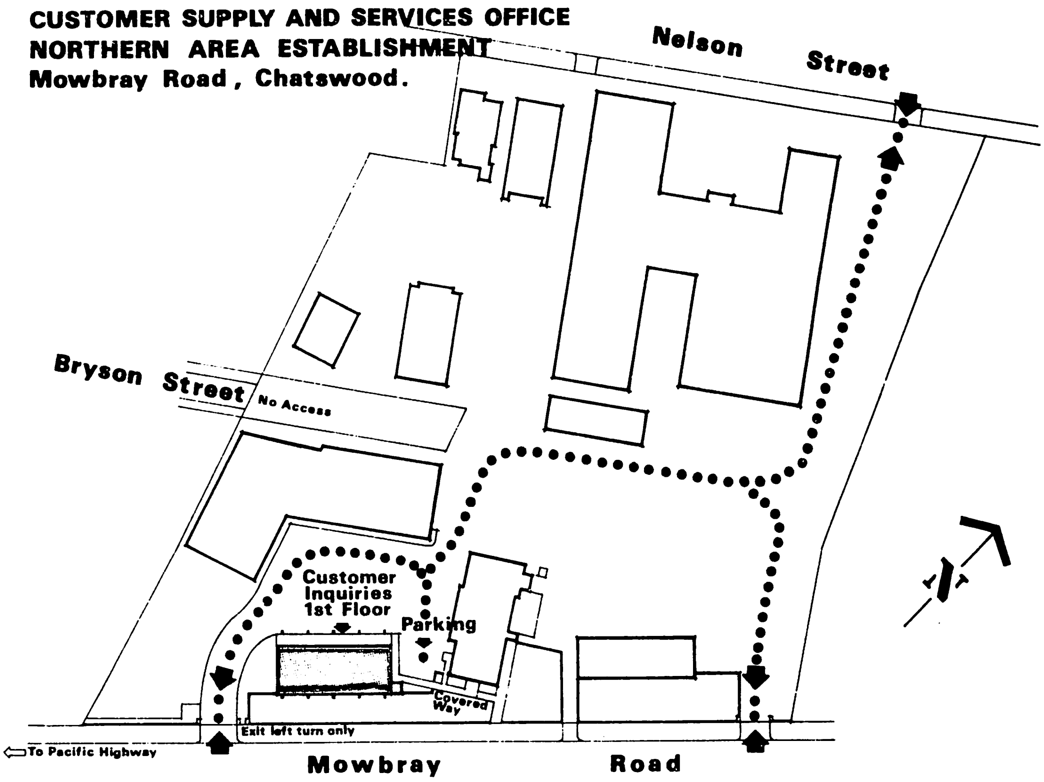
Repatriation Hospital
Rhodes
Rozelle

St. Peters (Part)
Stanmore
Strathfield
Summer Hill
Sydenham

Tempe

NORTHERN AREA OFFICE

On the 1st floor of the Customer Supply and Services Building (adjacent to Mowbray House), 337-355 Mowbray Road, Chatswood. Visitor parking is available between this building and Mowbray House.


CUSTOMER SUPPLY AND SERVICES OFFICE
NORTHERN AREA ESTABLISHMENT
Mowbray Road, Chatswood.
Nelson Street
Bryson Street
No Access
Customer Inquiries 1st Floor
Parking
Covered Way
Exit left turn only
To Pacific Highway
Mowbray Road
N

Telephone Inquiries: Mains - 410 5301
Inspections - 410 5305
Metering - 410 5353

Areas Served

MUNICIPALITIES OF KU-RING-GAI, LANE COVE, MOSMAN, NORTH SYDNEY, WILLOUGHBY

Comprised of the following localities:-

Artarmon

Balmoral Beach

Cammeray
Castle Cove
Castlecrag
Chatswood
Clifton Gardens
Cremorne Junction
Cremorne Point
Crows Nest

East Killara

Georges Heights
Gordon
Greenwich

Killara
Kirribilli

Lane Cove
Lane Cove West
Lindfield
Lindfield East
Longueville

McMahons Point
Middle Cove
Milsons Point
Mosman

Naremburn
Neutral Bay
Northbridge
North Sydney
Northwood

Pymble
Pymble West

Roseville
Roseville Chase
Roseville East

St. Ives
St. Ives Chase
St. Leonards
Spit Junction

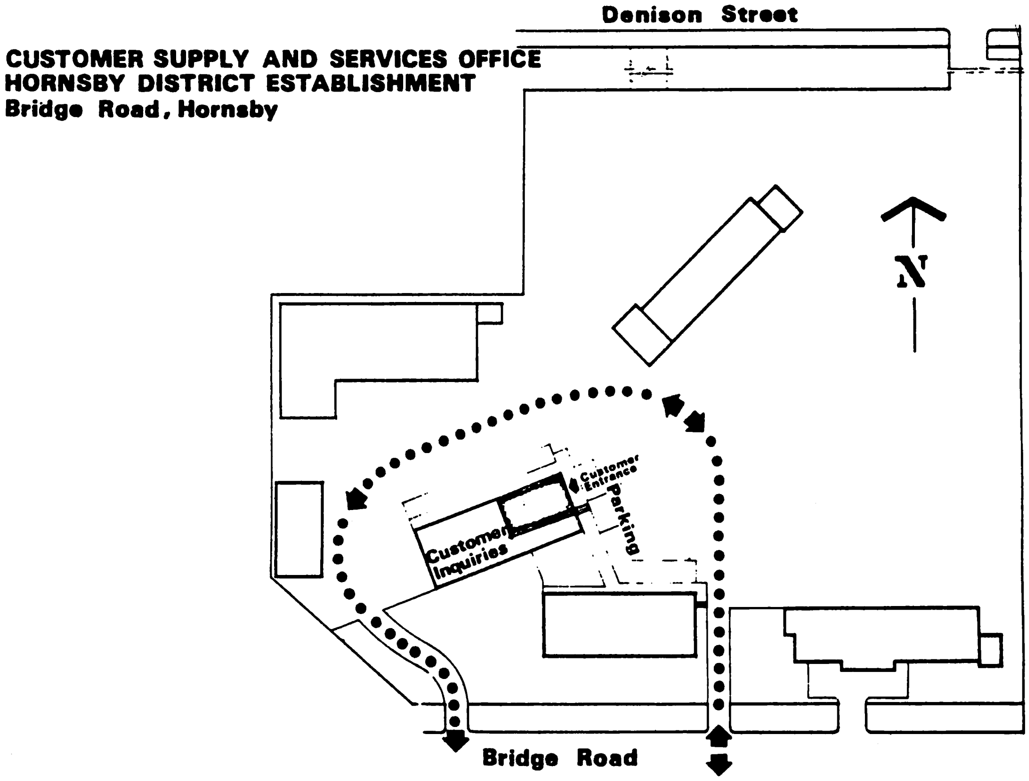
The Spit

Turramurra
Turramurra North
Turramurra South

Wahroonga (Part)
Wahroonga East
Warrawee
Waverton
Willoughby
Wollstonecraft

HORNSBY DISTRICT OFFICE

On the ground floor of the building at the rear of the Administration Building, Hornsby District Establishment, Bridge Road, near Sherbrook Road, Hornsby. Visitor parking is available at the entrance to the building.


Denison Street
CUSTOMER SUPPLY AND SERVICES OFFICE
HORNSBY DISTRICT ESTABLISHMENT
Bridge Road, Hornsby
N
Customer Entrance
Parking
Customer Inquiries
Bridge Road

Telephone Inquiries: Mains - 477 8201
Inspections - 477 8205
Metering - 477 8254

Areas Served

MUNICIPALITIES OF HUNTERS HILL AND RYDE, SHIRE OF HORNSBY, CITY OF PARRAMATTA (PORTION)

Comprised of the following localities:-

Arcadia
Asquith

Beecroft
Berowra
Berowra Waters
Berrilee
Boronia Park
Brooklyn

Carlingford
Castle Hill (Part)
Cheltenham
Cowan

Dangar Island
Denistone
Dundas
Dural

Eastwood (Part)
Epping
Ermington

Galston
Gladesville
Glenorie

Hornsby
Hornsby Heights
Hunters Hill
Huntleys Point

Marsfield
Meadowbank
Melrose Park
Middle Dural
Milsons Passage
Mt. Colah
Mt. Ku-ring-gai

Normanhurst
North Ryde

Peat Island
Pennant Hills
Putney

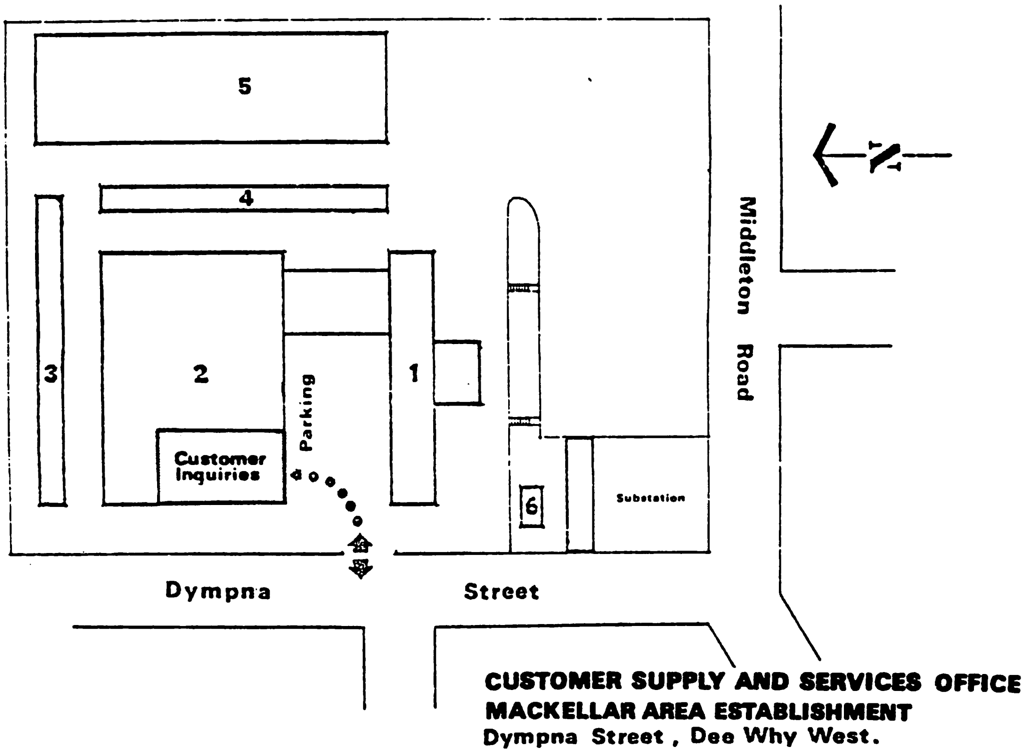
Rydalmere
Ryde

Thornleigh

Wahroonga (Part)
Waitara
Westleigh
West Pennant Hills
West Ryde
Woolwich

MACKELLAR AREA OFFICE

On the ground floor of Building 2, Dympna Street, Dee Why West Vehicle access is from Dympna Street and visitor parking is available as indicated on the map below.


5
4
3
2
1
6
Customer Inquiries
Parking
Substation
Middleton Road
Dympna Street
CUSTOMER SUPPLY AND SERVICES OFFICE
MACKELLAR AREA ESTABLISHMENT
Dympna Street, Dee Why West.

Telephone Inquiries: Mains - 981 9923
Inspections - 981 9920
Metering - 981 9935

Areas Served

MUNICIPALITY OF MANLY AND SHIRE OF WARRINGAH

Comprised of the following localities:-

Allambie
Allambie Heights
Avalon Beach

Balgowlah
Balgowlah Heights
Balgowlah North
Bantry Bay
Bayview
Beacon Hill
Belrose
Bilgola Beach
Bilgola Plateau
Brookvale
Bungan Beach

Careel Bay
Church Point
Clareville Beach
Clontarf
Collaroy Beach
Collaroy Plateau
Cromer
Curl Curl
Curl Curl North
Curl Curl South

Davidson
Dee Why
Dee Why Beach
Dobroyd Head
Duffys Forest

Elanora Heights

Fairlight
Forestville
Frenchs Forest
Harbord

Ingleside

Killarney Heights

Manly
Manly Vale
Mona Vale

Narrabeen
Narrabeen North
Narraweena
Newport
Newport Beach
North Balgowlah
North Curl Curl
North Head
North Manly
North Steyne

Oxford Falls

Palm Beach

Queenscliff
Refuge Cove

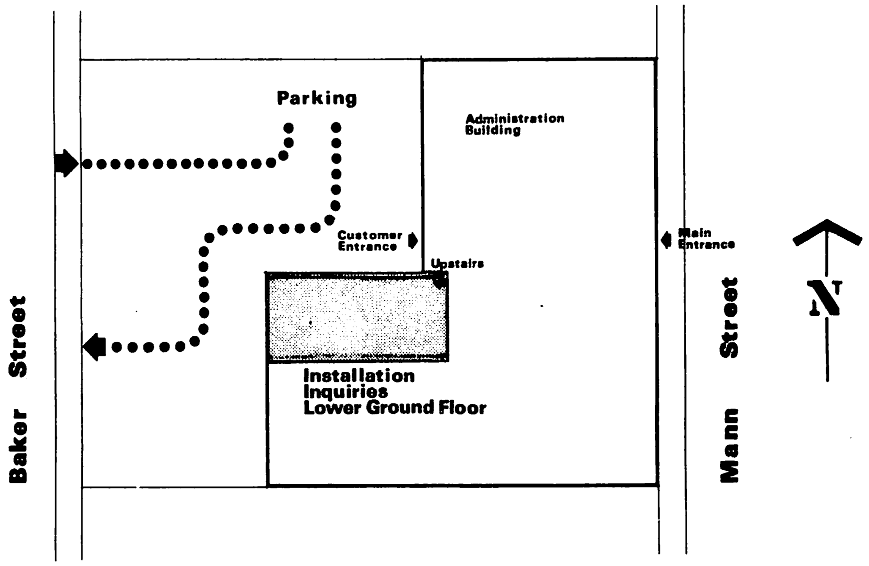
Seaforth
South Curl Curl
Stokes Point

Terrey Hills

Warriewood
Warringah Mall
Whale Beach
Wheeler Heights

BRISBANE WATER AREA OFFICE

On the lower ground floor of the Administration Building, 50 Mann Street, Gosford. Visitor parking is available at the rear of the building; entrance from Baker Street.


Parking
Administration Building
Customer Entrance
Upstairs
Main Entrance
Installation Inquiries Lower Ground Floor
Baker Street
Mann Street
N

CUSTOMER SUPPLY AND SERVICES OFFICE
BRISBANE WATER AREA
Mann Street , Gosford .

Telephone Inquiries: Mains; Inspections; Metering - (043) 24 1611

Areas Served

CITY OF GOSFORD AND SHIRE OF WYONG

Comprised of the following localities:-

Avoca

Bar Point
Bateau Bay
Bensville
Berkeley Vale
Booker Bay
Budgewoi

Calga
Central Mangrove
Chain Valley Bay
Charmhaven
Copacabana

Daleys Point
Davistown
Dooralong
Doyalson

Elizabeth Bay
Empire Bay

Erina
Ettalong

Gorokan
Gosford
Green Point
Gunderman
Gwandalan

Hardys Bay
Holgate

Jilliby

Kanwal
Killarney Vale
Killcare
Kincumber
Koolewong
Kulnura

Lake Munmorah

Lisarow
Little Wobby
Long Jetty

Mangrove Mountain
Mannering Park
Matcham
Mooney Mooney
Mt. White

Narara
Niagara Park
Noraville

Ourimbah

Patonga
Pearl Beach
Peats Ridge
Pretty Beach

Ravensdale

Saratoga
Somersby
Spencer
Springfield
St. Huberts Island

Tacoma
Terrigal
The Entrance
Toukley

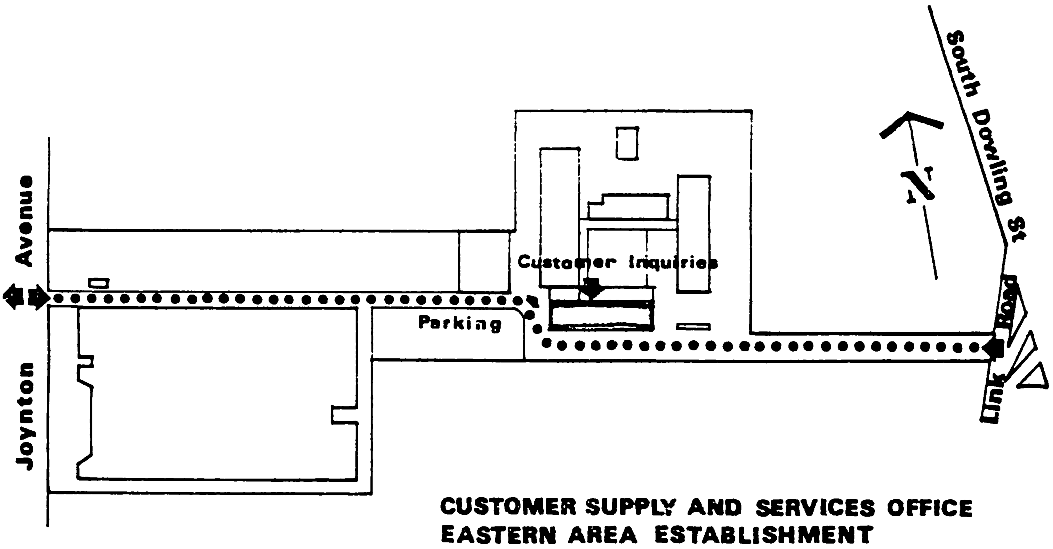
Umina

Wagstaff
Wamberal
Warnervale
Woy Woy
Wyong
Wyongah

Yarramalong

EASTERN AND CITY AREA OFFICE

On the 1st floor of the Administration Building, Eastern Area Establishment, 130 Joynton Avenue, Zetland. Vehicle entrance by the attended gate in Joynton Avenue or from Link Road, Kensington. Visitor parking is available outside western entrance to building.



CUSTOMER SUPPLY AND SERVICES OFFICE
EASTERN AREA ESTABLISHMENT
Joynton Avenue, Zetland.

Telephone Inquiries:	CITY		EAST	
	Mains	663 9394	Mains	663 9394
	Inspections	663 9301	Inspections	663 9304
	Metering	663 9360	Metering	663 9376

Areas Served

COUNCIL OF THE CITY OF SYDNEY, MUNICIPALITIES OF BOTANY, RANDWICK, ROCKDALE (PART), SOUTH SYDNEY, WAVERLEY, WOOLLAHRA

Comprised of the following localities:

CITY

Camperdown
Centennial Park
Chippendale
City

Darlinghurst
Darling Point
Darlington
Double Bay (Part)

East Sydney
Edgecliff (Part)
Elizabeth Bay
Erskineville (Part)

Haymarket

Kings Cross

Moore Park
Newtown

Paddington
Potts Point
Pyrmont

Redfern (Part)
Rushcutters Bay

Surry Hills
Sydney University

Ultimo

Woollahra (Part)
Woolloomooloo

EAST

Alexandria

Banksmeadow
Beaconsfield
Bellevue Hill
Bondi
Bondi Beach
Bondi Junction
Bondi North
Botany
Botany East
Bronte

Chifley
Clovelly
Coogee

Daceyville
Double Bay (Part)
Dover Heights

Eastlakes
Edgecliff (Part)
Erskineville (Part)

Hillsdale

Kensington
Kingsford

La Perouse
Little Bay

Macdonaldtown
Malabar
Maroubra
Maroubra Bay
Mascot
Matraville

Newtown (Part)

Pagewood
Phillip Bay
Point Piper

Randwick
Redfern (Part)
Rose Bay
Rosebery

St. Peters (Part)
Sydney Airport

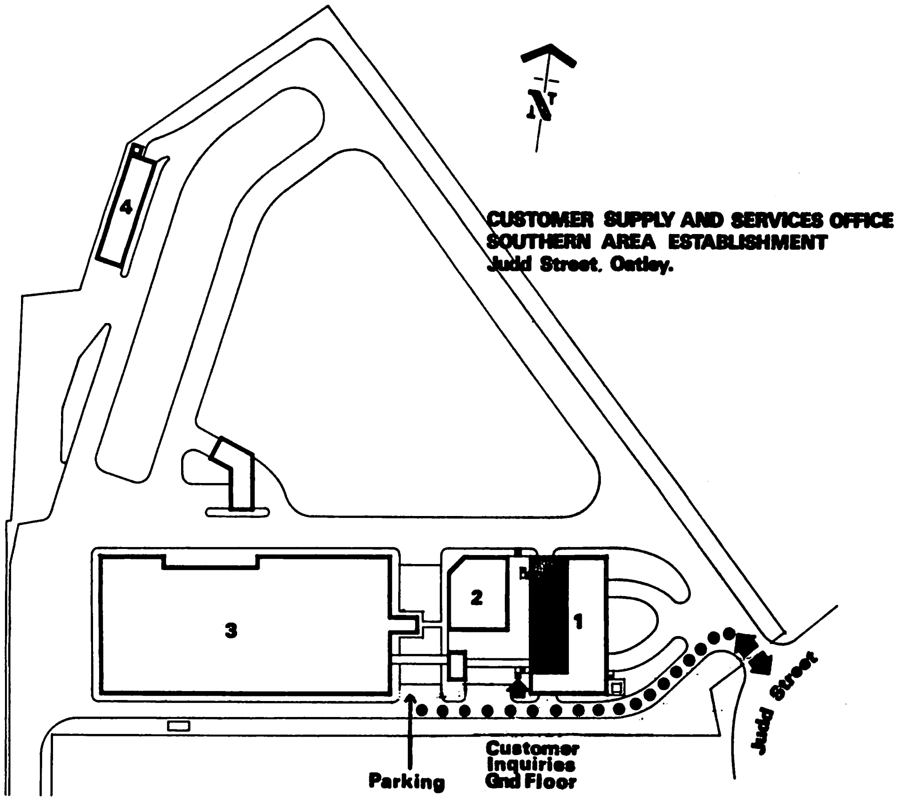
Vaucluse

Waterloo
Watsons Bay
Waverley
Woollahra (Part)

Zetland

ST. GEORGE AREA OFFICE

On the ground floor of the Administration Building, 33-45 Judd Street, Oatley. Visitor parking is available at the rear of the building; entrance from Premier Street.


CUSTOMER SUPPLY AND SERVICES OFFICE
SOUTHERN AREA ESTABLISHMENT
Judd Street, Oatley.
4
3
2
1
Judd Street
Parking
Customer Inquiries Gnd Floor

Telephone Inquiries:
Mains - 586 5724
Inspection - 586 5722,586 5723
Metering - 586 5725

Areas Served

MUNICIPALITIES OF HURSTVILLE, KOGARAH AND ROCKDALE (PART)

Comprised of the following localities:-

Allawah
Arncliffe

Banksia
Bardwell Park
Beverly Hills (Part)
Bexley
Bexley North
Blakehurst
Brighton-le-Sands

Carlton
Connels Point

Dolls Point

Hurstville
Hurstville South

Kingsgrove (Part)
Kogarah
Kyeemagh
Kyle Bay

Lugarno

Monterey
Mortdale
Narwee (Part)

Oatley

Peakhurst
Penshurst

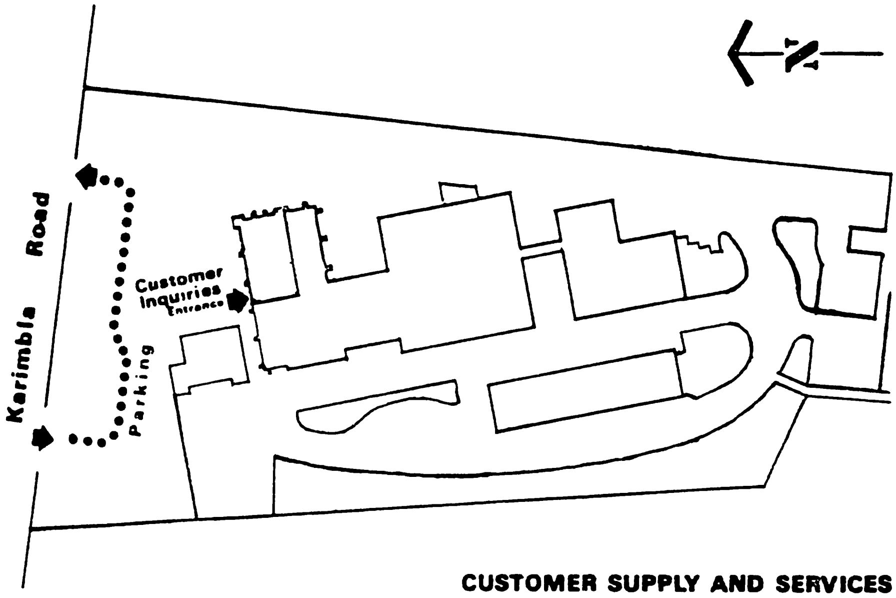
Ramsgate
Riverwood (Part)
Rockdale
Rocky Point

Sandringham
Sans Souci
South Hurstville

Turrella

SOUTHERN AREA OFFICE

On the 1st floor of the Administration Building, Southern Area Establishment, 66-74 Karimbla Road, Miranda. Visitor parking is available in front of the Mains Office at North-West corner of Establishment.



CUSTOMER SUPPLY AND SERVICES OFFICE
SUTHERLAND AREA ESTABLISHMENT
Karimbla Road, Miranda.

Telephone Inquiries:	Mains; Service Marking; Metering	- 526 3403, 526 3405
	Inspections (General)	- 526 3402, 526 3404
	Inspections (Technical)	- 526 3413

Area Served

SHIRE OF SUTHERLAND

Comprised of the following localities:-

Alfords Point

Bonnet Bay
Bundeena
Burraneer

Caringbah
Como
Cronulla

Engadine

Grays Point
Gymea

Heathcote

Illawong

Jannali

Kareela
Kirrawee
Kurnell

Lilli Pilli
Loftus
Lucas Heights

Maianbar
Menai
Miranda

Oyster Bay

Sutherland
Sylvania
Sylavania Waters

Taren Point

Waterfall
Woolooware
Woronora

Yarrawarrah
Yowie Bay

ELECTRICAL INSTALLATIONS BRANCH OFFICES

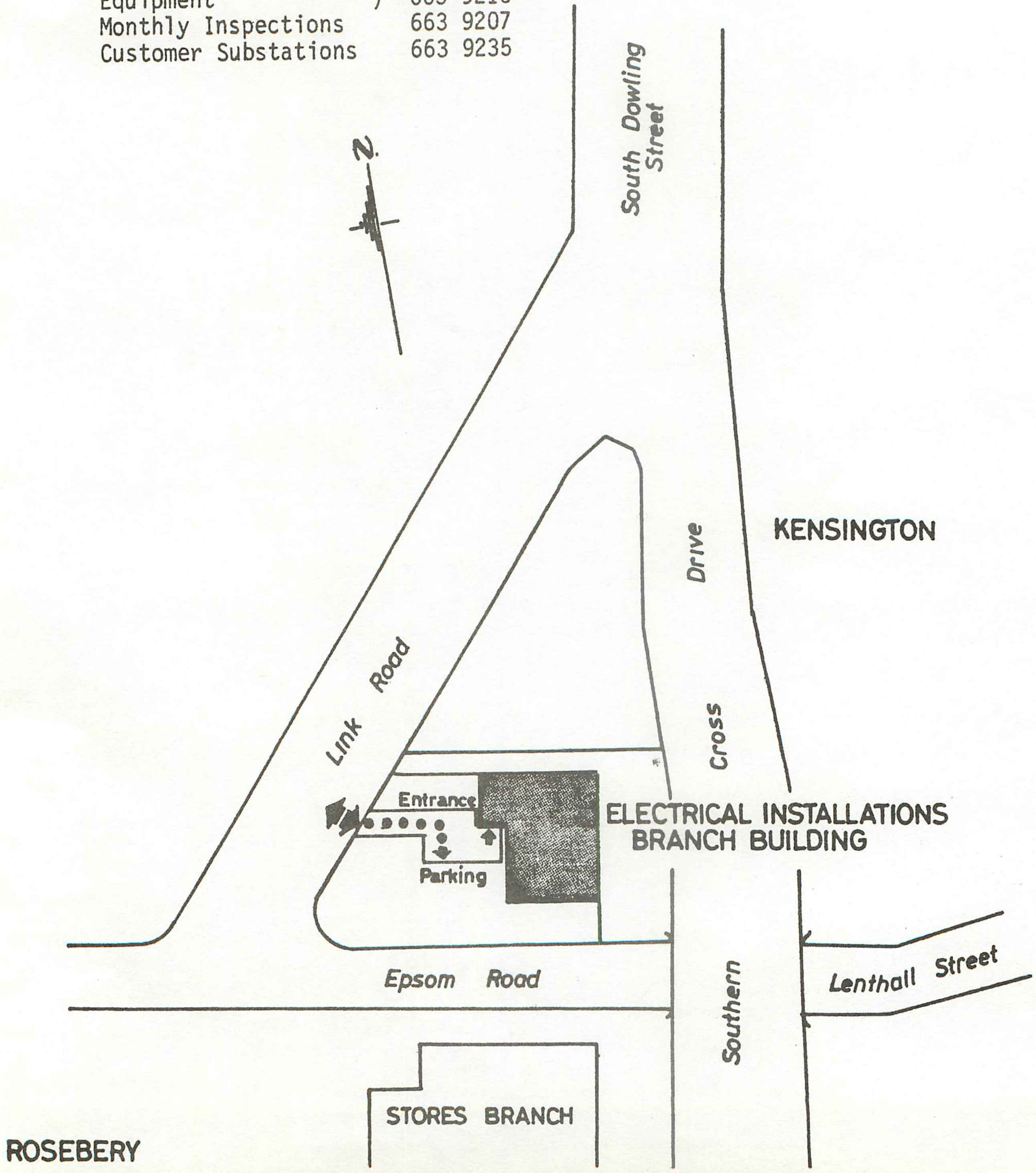
On the 1st floor of the Electrical Installations Branch Building, 132-142 Epsom Road (Cnr. Link Road), Rosbery.

Visitor parking is available on the western side of the building with access from Link Road.

A group of officers is available to deal with inquiries regarding customer substations and requirements relating to installation inspection where these are not associated with a particular address. Inquiries associated with a particular address should be referred to the appropriate Customer Supply and Service Office.

Telephone Inquiries

Wiring Rules	663 9208
Unusual Installations) and/or) Equipment)	663 9206 663 9209 663 9210
Monthly Inspections	663 9207
Customer Substations	663 9235


N
South Dowling Street
KENSINGTON
Link Road
Drive
Cross
Entrance
Parking
ELECTRICAL INSTALLATIONS BRANCH BUILDING
Epsom Road
Southern
Lenthall Street
STORES BRANCH
ROSEBERY

SYDNEY
COUNTY
COUNCIL

No. E.I. 3

FEBRUARY, 1986

Ready For Test Certificates

1. SCOPE.

2. REQUIREMENT OF NOTIFICATION.

3. ADVICE ON COMPLETING CERTIFICATES.
  3.1 IDENTIFICATION OF PREMISES.
  3.2 INFORMATION TO ESTABLISH PRIORITY.
  3.3 PARTICULARS OF THE WORK.
  3.4 INFORMATION NECESSARY TO DETERMINE ACTION PRIOR TO INSPECTION.
    3.4.1 General.
    3.4.2 "Minor" Alterations And Additions.
    3.4.3 Number Of Phases Of Supply.
    3.4.4 Determination Of The Maximum Demand.
  3.5 SIGNING OF CERTIFICATE.

4. APPOINTMENTS

5. LODGING OF CERTIFICATES.

6. RE-INSPECTION FEES.

7. SAA WIRING RULES.

8. FURTHER INFORMATION.

9. ISSUE DATE.

SYDNEY
COUNTY
COUNCIL

No. E.I. 3

FEBRUARY, 1986

Ready For Test Certificates

1. SCOPE

The purpose of this publication is to provide information on completing and using Ready For Test Certificates.

2. REQUIREMENT OF NOTIFICATION

The Consumers' Electrical Installations (Safety) Regulations under the Electricity Development Act, 1945, as amended, require that the Council, as a supply authority, be notified of the particulars of various types of work on a customer's installation within 14 days of such work being completed. The person responsible for carrying out the work is required to supply the notification by means of a certificate and in the case of the Council, this is required to be the Ready For Test Certificate (Form NG1875).

The types of work referred to are as follows:-

a) Any new installation.

b) Any addition, repair or alteration to a customer's installation which results in:-

  i) the replacement of any equipment on a switchboard or the installation of any additional equipment on a switchboard; or

  ii) an increase in the number of lighting or power outlets; or

  iii) an increase in the connected loading.

c) The remedying of any defect in a customer's installation as notified by the Council.

In addition, where new consumers mains have been installed in an existing installation as a result of a request from a Council officer, additional load and/or switchboard alterations, details of the consumers mains shall be notified as ready for connection by Ready For Test Certificate.

3. ADVICE ON COMPLETING CERTIFICATES

3.1 IDENTIFICATION OF PREMISES. To fulfil its purpose, the Certificate must clearly and specifically identify the customer, the type of installation, the location of the premises and the extent of the work to which it relates.

A complete address is essential for the purpose of locating the premises. In this regard, it is not sufficient to describe the premises as being on the corner of two streets and it is important to include the street number or other identifying number of the premises.

If the premises comprise a number of occupancies, e.g. blocks of offices, flats or home units or a factory complex, it is also necessary to give the number or numbers identifying the occupancy, the name of the occupant and preferably provide a sketch.

The customer code and meter number/s should be given when known.

The use of block lettering is requested to minimise the possibility of error.

3.2 INFORMATION TO ESTABLISH PRIORITY. Information requested in Section 2 of the Certificate is used to determine the nature of the work and to assess the priority for inspection. Premises in which some or all of the installation is awaiting the connection of supply are given priority where the work volume makes discrimination necessary.

So that Council's staff can assess the need for priority treatment, any alterations and additions which cannot be connected to the supply under the provisions of Clause 12 of publication E.I. 19 - "Alterations And Additions To Existing Installations" should be detailed in the appropriate columns in Section 3 of the Ready For Test Certificate.

3.3 PARTICULARS OF THE WORK. A full description is essential in Sections 3 and 4 of the Certificate to enable the extent and location of the work to be identified.

3.4 INFORMATION NECESSARY TO DETERMINE ACTION PRIOR TO INSPECTION

3.4.1 General. Information provided in Section 5 of the Certificate is used to determine action necessary by the Council prior to arranging for inspection of the alterations or additions. It is needed in order to avoid unnecessary on-site evaluation by Council officers and associated delay to contractors. Failure to provide required information may result in inspection being delayed.

3.4.2 "Minor" Alterations And Additions. Where the alteration or addition is classified as "minor" as defined in Clause 3.2 of publication E.I. 19 - "Alterations And Additions To Existing Installations", it will not be necessary for the Council's officers to carry out work prior to the inspection of the alterations or additions.

Examples of answers to Questions 1-4 which indicate classification as "minor" are as follows:-

EXAMPLE NO. 1

5

THIS SECTION IS NOT APPLICABLE WHERE THE SUPPLY IS TO NEW PREMISES
PLEASE TICK (✓) APPROPRIATE SQUARE

	"YES"	"NO"
1. Do the load additions necessitate additional phases of supply?	☐	☑
2. (a) Is any additional meter or off-peak control device necessary?	☐	☑
b) Where the answer to (a) is "yes", does suitable space exist on the present meter board for any additional meter and / or off-peak control device necessary? (See Publication E.I. 19)	-	-
3. (a) Are the consumer's mains being replaced?	☐	☑
b) Where the answer to (a) is "yes", does the location of the service equipment (e.g., service lines, service fuses, meters) comply with the requirements of Publication E.I. 19?	-	-
4. Is it necessary to work in conjunction with the Council's mains or metering technicians?	☐	☑

NOTE: Where the answer to (4) is "yes", an appointment is to be made in person or by telephone at the appropriate Customer Supply and Services Office.

EXAMPLE NO. 2

5

THIS SECTION IS NOT APPLICABLE WHERE THE SUPPLY IS TO NEW PREMISES
PLEASE TICK (✓) APPROPRIATE SQUARE

	"YES"	"NO"
1. Do the load additions necessitate additional phases of supply?	☐	☑
2. (a) Is any additional meter or off-peak control device necessary?	☑	☐
b) Where the answer to (a) is "yes", does suitable space exist on the present meter board for any additional meter and / or off-peak control device necessary? (See Publication E.I. 19)	☑	☐
3. (a) Are the consumer's mains being replaced?	☑	☐
b) Where the answer to (a) is "yes", does the location of the service equipment (e.g., service lines, service fuses, meters) comply with the requirements of Publication E.I. 19?	☑	☐
4. Is it necessary to work in conjunction with the Council's mains or metering technicians?	☐	☑

NOTE. Where the answer to (4) is "yes" an appointment is to be made in person or by telephone at the appropriate Customer Supply and Services Office.

3.4.3 Number of Phases of Supply. In answering Question 1 of Section 5 of the Ready For Test Certificate, the contractor may assume that a customer who already has a single phase supply will continue to receive a single phase supply except where -

i) the maximum demand, determined in accordance with Clause 2.5 of the SAA Wiring Rules, exceeds 80 amperes; or

ii) a 3 phase motor of rating in excess of 2kW is to be connected; or

iii) a written application is made and agreed to, for the provision of additional phases of supply. The application is required to set out full details of the load within the premises to enable a decision to be made in accordance with Service Rule 2.8.

3.4.4 Determination Of The Maximum Demand. Question 6 in Section 5 of the Certificate requires the maximum demand in amperes in each phase, after the connection of additional load. In the case of both single and multiple domestic premises, the question need not be answered.

The maximum demand should be determined in accordance with Clause 2.4 of the SAA Wiring Rules.

3.5 SIGNING OF CERTIFICATE

The Licensed "A" Grade Electrical Mechanic who either carries out or supervises the work is required to complete and sign Section 6 of the Certificate. Where the above person is registered as an Electrical Contractor or is employed by a Registered Electrical Contractor, Section 7 of the Certificate must be completed.

Under certain circumstances, the need to complete Section 7 of the Certificate is exempted by provisions in Section 22 of the Electricity Development Act which permit electrical wiring work to be carried out by an "A" Grade Licensed Electrical Mechanic who is not a Registered Electrical Contractor. The exemptions are:-

(a) An "A" Grade Licensed Electrical Mechanic is not required to be a Registered Electrical Contractor when he carries out electrical wiring work without profit or reward.

(b) Any person or persons who carry on a trade or business which is not trading as an Electrical Contractor may employ a licensed "A" Grade Electrical Mechanic for the purpose of maintaining the electrical installation for the conduct of that trade or business on the premises owned by that person or persons.

4. APPOINTMENTS

Ready For Test Certificate forms include a warning that they cannot be used to arrange appointments and no notice will be taken of any such requests included on the Certificate. Should an appointment be proposed, an officer of the Customer Supply and Services Section located at the appropriate Area or District office should be visited or telephoned in order to discuss the matter. However, where a contractor requests on the Ready For Test Certificate that no action be taken pending further notification, the Certificate will be held for 7 days. If no such notification is forthcoming, normal inspection procedures will apply.

5. LODGING OF CERTIFICATES

Ready For Test Certificates should preferably be lodged at the Customer Supply and Services office for the District or Area in which the installation concerned is located. However, they may also be lodged at the various Council Customer Service Centres, at the S.C.C. Building or at any Area or District Customer Supply and Services office.

Facilities for lodging Ready For Test Certificates are also available at the Bank Street entrance to the Ryde District Establishment, corner Bank Street and Constitution Road, Meadowbank. This facility is solely for Ready For Test Certificates and cannot be used for correspondence or the payment of re-inspection fees. The box provided is cleared on normal working days at 8.45 a.m.

6. RE-INSPECTION FEES

No charge is made for the initial inspection and test, but in general, a charge is made for every subsequent inspection and test found necessary. These re-inspection fees will be charged even though the defects found during a number of separate inspections are finally checked and found to be in order during one final re-inspection or during the inspection of further portions of the installations. The payment of a re-inspection fee is taken as notification that the defects have been rectified.

Records of inspection are filed under the customer's name and address. To enable any correspondence or re-inspection fee payment to be identified, contractors are requested to supply the name of the customer and the address of the premises concerned as well as the report number. When only a report number is quoted, delay is likely to occur.

7. SAA WIRING RULES

The Consumers' Electrical Installations (Safety) Regulations made under the Electricity Development Act require new installations and alterations and additions to existing installations to comply with the SAA Wiring Rules.

The Standards Association of Australia also issues the publication "Doc. 3000R, Rulings to the SAA Wiring Rules" containing interpretations of various clauses of AS3000 - SAA Wiring Rules. They are referred to as "Commonwealth Rulings" and will in general be applied by the Council's officers when inspecting an installation.

Doc. 3000R is available in loose leaf form from the Standards Association of Australia. Arrangements for purchase and future updating should be directed to the Association.

8. FURTHER INFORMATION

The following publications are relevant to this matter:-

E.I. 1 - "Customer Supply Procedures".
E.I. 2 - "Customer Supply Inquiries".
E.I. 19 - "Alterations And Additions To Existing Installations".

9. ISSUE DATE

This publication dated February, 1986, supersedes that of the same number and title dated May, 1985.

SYDNEY
COUNTY
COUNCIL

No. E.I. 4

MARCH, 1983

Temporary Wiring

1. SCOPE.

2. GENERAL.

3. REQUIREMENTS APPLYING TO BUILDING ACTIVITIES.
  3.1 WIRING SYSTEMS.
    3.1.1 Insulated Stranded Cables Enclosed in Strong Canvas Hose.
    3.1.2 Insulated Stranded Cables Enclosed in Flexible Thermoplastic Conduit, or in substantial Plastic or Rubber Hose.
    3.1.3 Sheathed Cables.
    3.1.4 Circuits Connected by Means of Plugs.
    3.1.5 Wiring Within Switchboard Enclosures.
  3.2 240 VOLT PORTABLE PLUG SOCKET BOARDS.
  3.3 EARTHING.
  3.4 NUMBER OF POINTS PER FINAL SUB-CIRCUIT.

4. REQUIREMENTS APPLYING TO EXHIBITIONS IN PERMANENT BUILDINGS AND TO TEMPORARY DECORATIVE LIGHTING.
  4.1 WIRING SYSTEMS.
  4.2 240 VOLT PLUG SOCKETS.
  4.3 EARTHING.
  4.4 NUMBER OF POINTS PER FINAL SUB-CIRCUIT.

5. FESTOON LIGHTING.

Temporary Wiring

1. SCOPE

This publication sets out the requirements of this Council in respect of wiring which it will permit to be connected to its system on a temporary basis and is not wired in accordance with the SAA Wiring Rules AS3000 for permanent wiring.

2. GENERAL

Some relaxation of requirements applying to permanent wiring is permitted in respect of wiring installed for a limited period as provided for in Clause 3.33 of the SAA Wiring Rules AS3000-1981.

It should be noted that this publication does not cover Shows and Carnivals which involve temporary installations in booths, tents, living quarters and other temporary structures and areas used for entertainment or display. Clause 6.9 of the SAA Wiring Rules AS3000-1981 requires such installations to comply with the relevant requirements of AS3002 - "SAA Code for Electrical Installations in Shows and Carnivals".

A request for permission is required in all cases where it is proposed to connect temporary wiring. After a "Ready for Test" certificate has been received, the temporary wiring will be inspected and if found satisfactory, connected to the supply for a period not exceeding 3 months, but renewal of such permit for further periods of not more than one month at a time may be granted.

The customer is required to maintain the temporary wiring in a satisfactory condition and the Council makes further inspections periodically.

The Council makes a charge for any work of a temporary nature necessary for the connection of the temporary wiring to the Council's system and also for the initial inspection of the work. The first check inspection made three months after the initial inspection is free but a charge is made for each subsequent check inspection at intervals of approximately 1 month until the temporary wiring is disconnected or made permanent. A charge is also made for the inspection of subsequent additions to temporary wiring.

3. REQUIREMENTS APPLYING TO BUILDING ACTIVITIES

3.1 WIRING SYSTEMS

The following wiring methods are acceptable:-

3.1.1 Insulated Stranded Cables Enclosed in Strong Canvas Hose

This system is not acceptable for consumers mains on the supply side of the Council's service fuses but may be used for other purposes if the following requirements are met:

(a) The system shall be adequately supported, not necessarily on insulators, in such a manner that it is not liable to be inadvertently disturbed by workmen or others,

(b) The supports shall be such as to hold the wiring firmly without damaging either the cables or the canvas hose,

(c) The hose and the cables shall be firmly anchored at switchboards and any other places near connections, so that the terminals will not be subjected to any strain,

(d) The wiring shall be used in dry situations only,

(e) The wiring shall be provided with additional protection where subject to injury. Substantial battens fixed on either side, cover strips or similar alternative protection are acceptable.

3.1.2 Insulated Stranded Cables Enclosed in Flexible Thermoplastic Conduit, or in Substantial Plastic or Rubber Hose

This system may be installed in accordance with 3.1.1 and may also be used where it is exposed to the weather or is in a damp situation.

The system may also be used without further protection where it is likely to be walked on only occasionally or is subject only to minor bumping. It shall not be installed without further protection where it is likely to be subject to injury caused by the use of heavy material, barrows or other vehicles with steel or hard rubber tyres and the like.

Provided it is effectively protected from mechanical injury by location or otherwise, this system may be used for consumers mains both on the supply and load sides of the service fuses.

3.1.3 Sheathed Cables

Sheathed cables shall be supported and fixed in such positions or protected in such a manner that the possibility of their being damaged is reduced to a minimum. If the method of fixing is such that there is a likelihood of damage to the cable at a point due to sharp edges or corners, suitable sleeving, packing or other form of protection must be provided at this point.

If installed in positions where they are likely to be subject to mechanical injury, they shall be further protected by battens, cover strips, conduit, piping or similar means.

Tough rubber sheathed cables used for temporary wiring may be exposed to the weather and direct sunlight, provided that the rubber sheathing is in good condition.

3.1.4 Circuits Connected by Means of Plugs

Where the circumstances warrant, temporary circuit wiring may be connected by means of a plug to a plug socket. However, where this is done, the circuit conductors must not be connected directly into the plug. A length of flexible cord of the sheathed general purpose type and approximately one metre in length shall be connected between the plug and the circuit cables. For this purpose, a taped joint between the flexible cord and the circuit cables may be accepted provided that the joint is adequately insulated and no tension in the cable can cause stress on the conductors at the joint.

3.1.5 Wiring Within Switchboard Enclosures

Where a switchboard is enclosed in a fire-resistant box, the wiring within the box may be carried out in unsheathed insulated cables.

This wiring may be run on the inside face of the box, neatly arranged and held in position so that access to the switchboard will not be hindered and so that the cables will not be subject to movement at any time.

Where a switchboard is arranged with space behind for switchboard wiring, it need not comply fully with Clause 2.21 of the SAA Wiring Rules AS3000-1981 provided that sufficient space is available to gain reasonable access to the wiring.

3.2 240 VOLT PORTABLE PLUG SOCKET BOARDS

Portable plug socket boards shall not be used for appliances which are in continuous use such as urns and wash boilers. However, they may be used for the connection of temporary lighting, hand lamps, hand tools and the like and, if not of an approved type, shall comply with the following requirements:-

(a) The material used for the panel and enclosure shall be strong and durable.

(b) Unless of the flush or metal-clad type, all equipment mounted on the board shall be protected from inadvertent damage. This may be done by extending the sides and/or fitting a cover.

(c) The flexible cord supplying the unit shall be of the sheathed general purpose type and have a current rating of not less than 10 amperes.

(d) The loading of the flexible cord shall not exceed the rating as set out in Table B10 of the SAA Wiring Rules AS3000-1981.

(e) The flexible cord shall have an effective cord anchorage at the unit.

(f) The flexible cord shall enter the enclosure at the side.

(g) The number of outlets mounted on one board shall not exceed four.

(h) Each outlet shall be controlled by a double-pole switch.

(i) The earthing pin of each outlet shall be earthed.

3.3 EARTHING

Earth clips need not be painted and may be installed in damp situations.

3.4 NUMBER OF POINTS PER FINAL SUB-CIRCUIT

For final sub-circuits protected by circuit breakers, there shall be no limit to the number of points which may be connected.

4. REQUIREMENTS APPLYING TO EXHIBITIONS IN PERMANENT BUILDINGS AND TO TEMPORARY DECORATIVE LIGHTING

4.1 WIRING SYSTEMS

As set out in 3.1.1 and 3.1.2, except that stranded thermoplastic or elastomer-insulated cables may be installed without further protection of strong canvas hose, flexible thermoplastic conduit or substantial plastic or rubber hose as otherwise would be required in 3.1.1 and 3.1.2, provided that they are out of reach and supported on insulators or non-hygroscopic insulating materials, including hardwood, and are not subject to mechanical injury. The stranded thermoplastic or elastomer-insulated cables may also be used to connect switchboard equipment where the wiring and equipment are not accessible to the public.

For circuits connected by means of plugs, requirements are the same as set out in Clause 3.1.4.

4.2 240 VOLT PLUG SOCKETS

A number of 240V plug sockets, not exceeding 15, mounted on a stand or display dais for the connection of appliances need not be controlled by individual switches provided that:-

(a) The appliances are normally left connected whilst on display (e.g. a series of T.V. receivers, sewing machines, and the like).

(b) The plug sockets are grouped together or are located within a defined zone on the stand or dais.

(c) Control of the group of plug sockets is by a single switch located in a prominent and readily accessible position which is within view of the plug sockets. The current rating of the switch shall be at least equal to the current rating of the circuit conductors. It shall be clearly marked to indicate the plug sockets it controls.

(d) The total connected load must not exceed that of the current rating of the circuit conductors.

4.3 EARTHING

As set out in 3.3.

4.4 NUMBER OF POINTS PER FINAL SUB-CIRCUIT

As set out in 3.4.

5. FESTOON LIGHTING

It should be noted that in respect of temporary festooning, the Council does not permit any variation to the requirements of Clause 3.32 of the SAA Wiring Rules AS3000-1981.

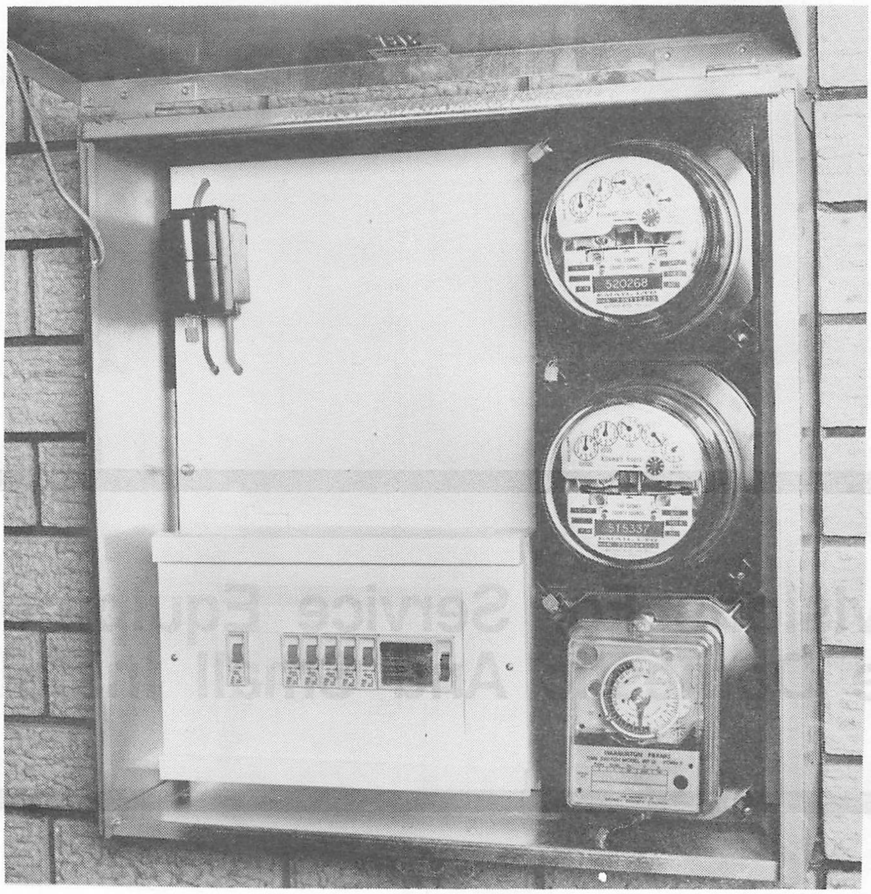
This publication supersedes that of the same number and title dated February, 1979.

THE
SYDNEY
COUNTY
COUNCIL

E.I. 7

APRIL, 1990

Provisions For Service Equipment In Single Domestic And Small Installations



APRIL, 1990

SCOPE

This publication sets out the provisions which must be made by a customer, in accordance with the Council's Service and Installation Rules, for the installation by the Council of service equipment in premises which are suitable for the use of a Department of Minerals and Energy approved standard meter box panel.

WARNING

It is illegal for persons other than licensed electrical mechanics, or persons authorised by legislation, to work on the fixed wiring of any electrical installation.

Penalities for conviction are severe.

ISSUE

This is the 6th edition of the publication and supersedes that last issued in August, 1984.

ISSN 1032-7215

Published and printed by the Sydney County Council.

Copyright ©, The Sydney County Council. This publication may only be reproduced with the permission of the Council.

All correspondence should be directed to:

The General Manager
The Sydney County Council
GPO Box 4009
SYDNEY NSW 2001

Contents

Clause Page

1. GENERAL REQUIREMENTS 1

2. DETERMINING THE METHOD OF SUPPLY 1

3. CONNECTION TO THE PREMISES 1

3.1. Aerial Service Lines. 1
3.2. Underground Service Cables. 1
3.3. Connections at Service Equipment. 1

4. FACILITIES FOR INSTALLATION OF METERS AND OTHER EQUIPMENT 1

4.1. Standard Panel and Meter Box. 1
4.2. Socket Bases. 4
4.3. Wiring. 4
4.4. Fixings. 4
4.5. Protection from Weather, etc. 4
4.6. Accessibility. 6

5. SEALING 6

6. DRAWINGS 6

Provisions For Service Equipment In Single Domestic And Small Installations

1. GENERAL REQUIREMENTS

The customer shall provide mounting and installation facilities for service equipment in positions satisfactory to the Council. "Service equipment" as referred to in this document includes service lines and cables, service fuses and neutral links, meters and customer-load-control equipment. This equipment is supplied and installed by the Council and shall remain its property. The Council also installs and maintains the connection between its system and the customer's installation.

When applying for additional supply, reference should be made to publication EI 19 - Alterations And Additions To Existing Installations.

2. DETERMINING THE METHOD OF SUPPLY

It is the responsibility of customers' electrical contractors to determine the method by which supply is to be made available to single domestic installations in built up areas. In this regard reference should be made to publication EI 30 - Determining The Method Of Supply To Single Domestic Premises for guidance as to the Council's requirements.

3. CONNECTION TO THE PREMISES

3.1. Aerial Service Lines.

The customer shall provide, install and maintain any support on private land for the service line and shall carry out any work and provide and install any equipment required by the Council on such support, point of attachment or point of connection. Detailed requirements are set out in publication EI 15 - Aerial Service Lines.

3.2. Underground Service Cables.

Underground service cables are generally installed only in areas where the street mains are already underground. Advice must be sought from the Council of the location of its street mains. The customer shall provide, install and maintain a conduit or set of conduits and any associated facilities required by the Council for the installation of the service cable. Detailed requirements are set out in publication EI 16 - Underground Service Cables In Single Domestic And Small Installations.

3.3. Connections at Service Equipment.

The customer shall arrange for the installation of a sufficient length of thermoplastic or elastomer insulated stranded copper-conductor cable generally not exceeding 16mm^2 as consumers mains for connection at the consumers terminals and at the line terminal of the service fuse(s) and neutral link.

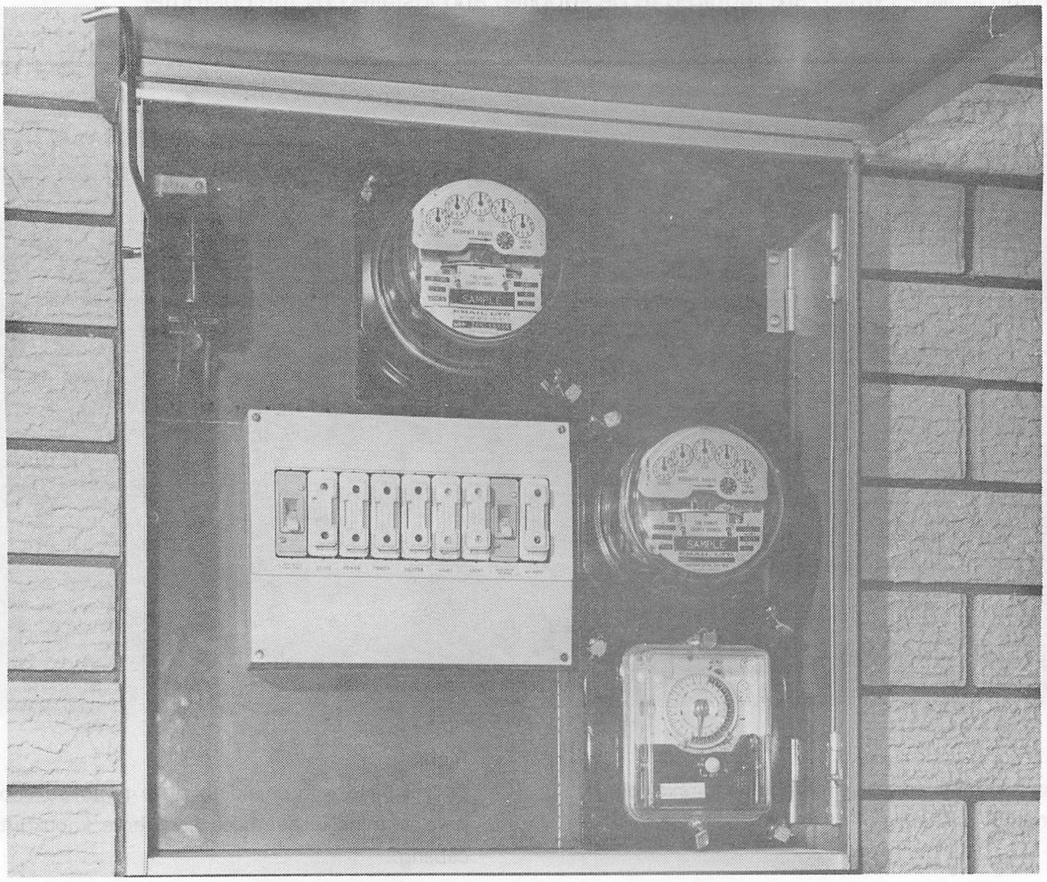
In some instances consumers mains exceeding 16mm^2 may be necessary to reduce voltage drop or for other reasons. If the cable used in these circumstances is 25mm^2 the Council will install a larger than normal service neutral link to facilitate the termination of the consumers mains on the standard panel.

Consumers mains exceeding 25mm^2, or which do not have stranded copper conductors, shall be either jointed in an approved manner to 16mm^2 copper conductor cables or terminated in suitable sealable reducing links located on the wall in the space behind a hinged panel or on the back of the inisde of the meter box.

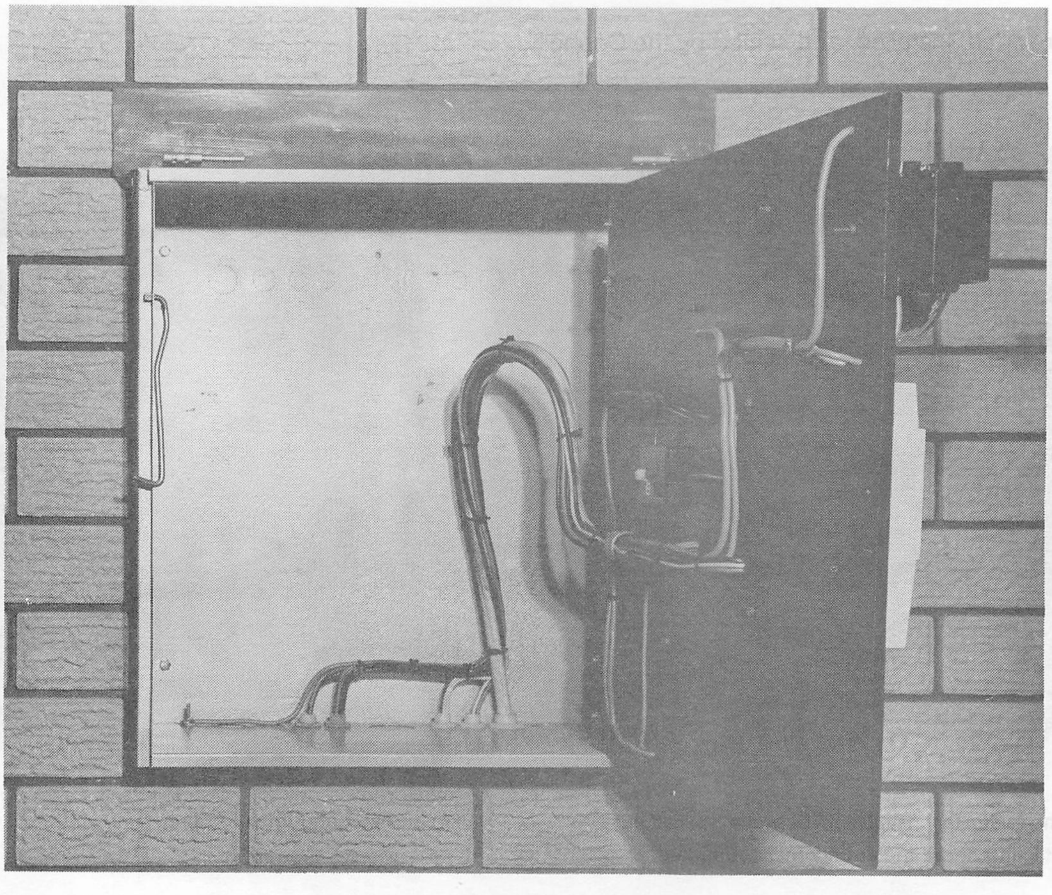
The customer shall also arrange for the installation of all wiring on the load side of the Council's service fuses and neutral link in accordance with drawing No. EI 104.

Two cables are permitted to be terminated on the load side at each service fuse to enable supply to be provided to separately metered portions of the installation. Where more than two such portions have to be supplied, the customer is required to install a suitable sealable link.

A person other than an employee of the Council shall not make any connection to, or disconnection from, conductors directly connected to the Council's supply system or insert a conductor into any item of the Council's service equipment except as authorised by the General Manager.

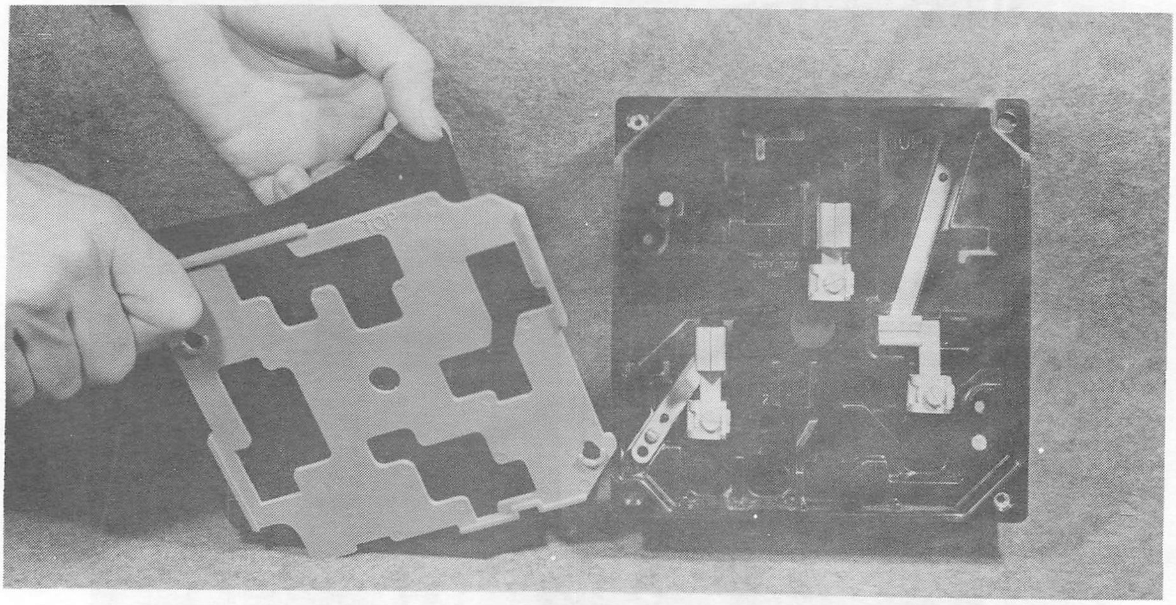


Typical Department of Minerals and Energy meter box equipped for single phase supply with a meter for Domestic Tariff and a customer-load-control device and meter for an Off Peak Tariff.



Back of panel showing wiring and the Council's service neutral link.

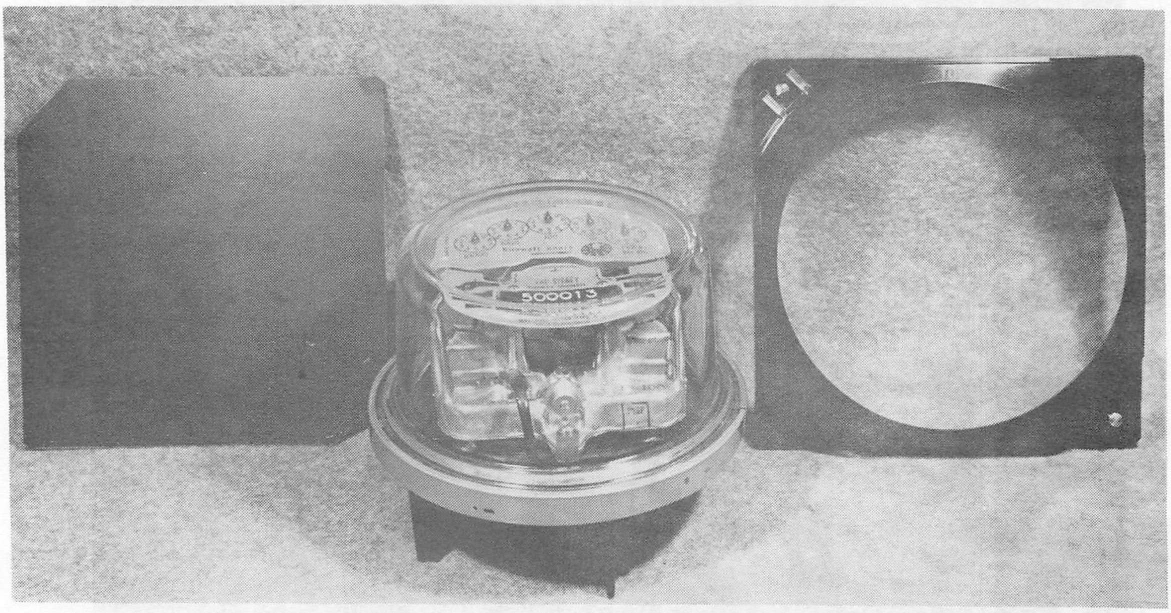
Mounting facilities which are required to be supplied and installed by the customer.



Left:
Shielding plate with adhesive membrane for excluding dust pending installation of meter.

Right:
Socket base with shielding plate removed showing jaws, terminal assemblies and three knockouts for cabling.

Items provided, installed, and sealed by the Council.



Left:
Blanking plate for installation between socket base and retaining ring if meter becomes redundant.

Right:
Plug-in meter and retaining ring.

Customers are advised to use panels which bear a mark indicating that they are listed by the Department of Minerals and Energy as complying with the published standard (drawing No. EI 108). These panels and associated meter boxes and surrounds are available from trade suppliers.

4. FACILITIES FOR INSTALLATION OF METERS AND OTHER EQUIPMENT

4.1. Standard Panel and Meter Box.

The customer shall provide and install in accordance with drawings Nos. EI 103 and EI 104, a standard hinged pre-drilled panel complete with the required arrangement of fully connected socket bases for the mounting of the Council's plug-in meters and control equipment.

The panel shall be mounted either -

- in a standard meter box which is marked to indicate that it is listed by the Department of Minerals and Energy as complying with the Department's published standard (drawing No. EI 107); or
- on a suitable surround of steel not less than 1.2mm thick providing at least 75mm of space behind the panel, erected in a location which is suitably protected.

Except where otherwise nominated by the Council, the panel shall be mounted at a height which complies with drawing No. EI 103. A clearance of 200mm shall be maintained from the front face of the hinged panel to any fixed object with the panel open 90° on its hinges. If the panel is enclosed, other than in the standard meter box, a clearance of 175mm shall be provided from the front face of the panel to the door.

4.2. Socket Bases.

The socket bases which have to be provided by the customer are available from trade suppliers.

The complete socket assembly is illustrated on page 3. It should be noted that:-

- only the "knockouts" on the bottom side of the back of the base should be opened out;
- each terminal provides for the connection of one cable of up to 25mm^2 c.s.a.;
- the moulded retaining ring and sealable screws are provided and fitted by the Council's officer when supply is being connected;
- the temporary plastic membrane must be left in position under the shielding plate pending the installation of the Council's equipment;
- if it should be necessary to leave a socket connected to the supply without a meter or load control device plugged into it, a suitable cover plate must be inserted between the retaining ring and the socket base. This will be supplied and sealed by the Council's officer.

4.3. Wiring.

The wiring and the arrangement of the equipment on the standard panel is required to be in accordance with drawing No.EI 104 and with the SAA Wiring Rules.

Where it is necessary for 25 mm^2 cable to be used, the holes required to be drilled in the standard meter box panel are to be of 12 mm diameter.

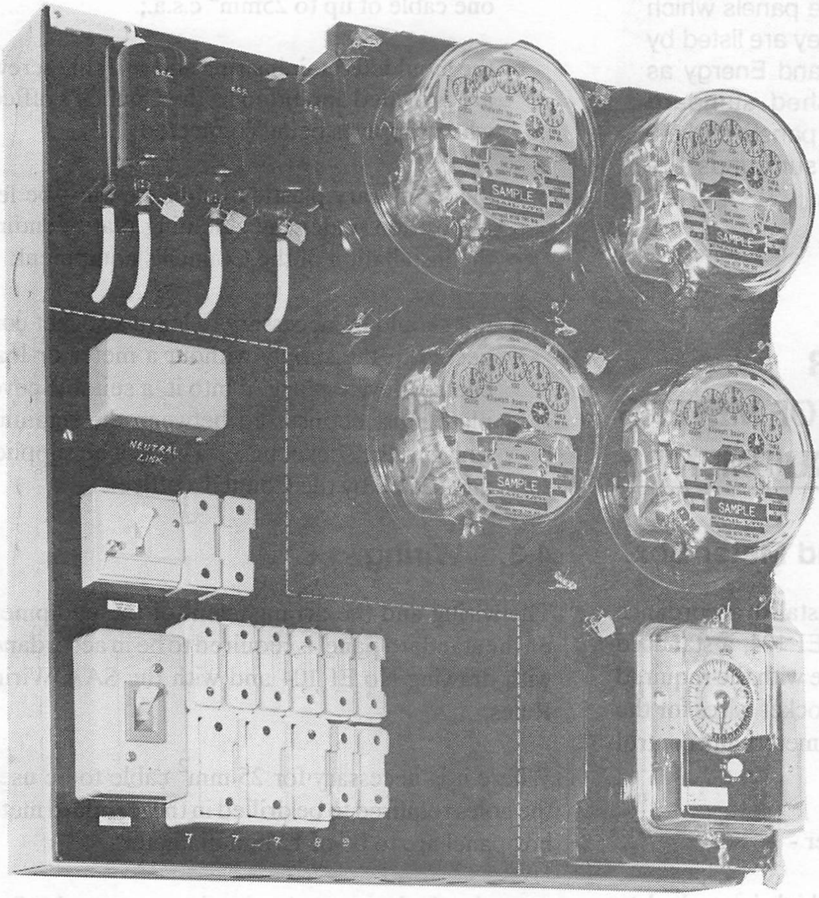
Attention is drawn to the requirements under Sections 2.21 to 2.25 of the SAA Wiring Rules, dealing with switchboards. With all wiring connected, the panel is required to be capable of being swung on its hinges through an angle of at least 60° without difficulty and without the movement of cables at terminals.

The standard meter box or surround for a standard meter box panel is to be bonded to the consumers mains neutral conductor in accordance with Clauses 5.3.2.4 and 5.5.3.2 of the SAA Wiring Rules.

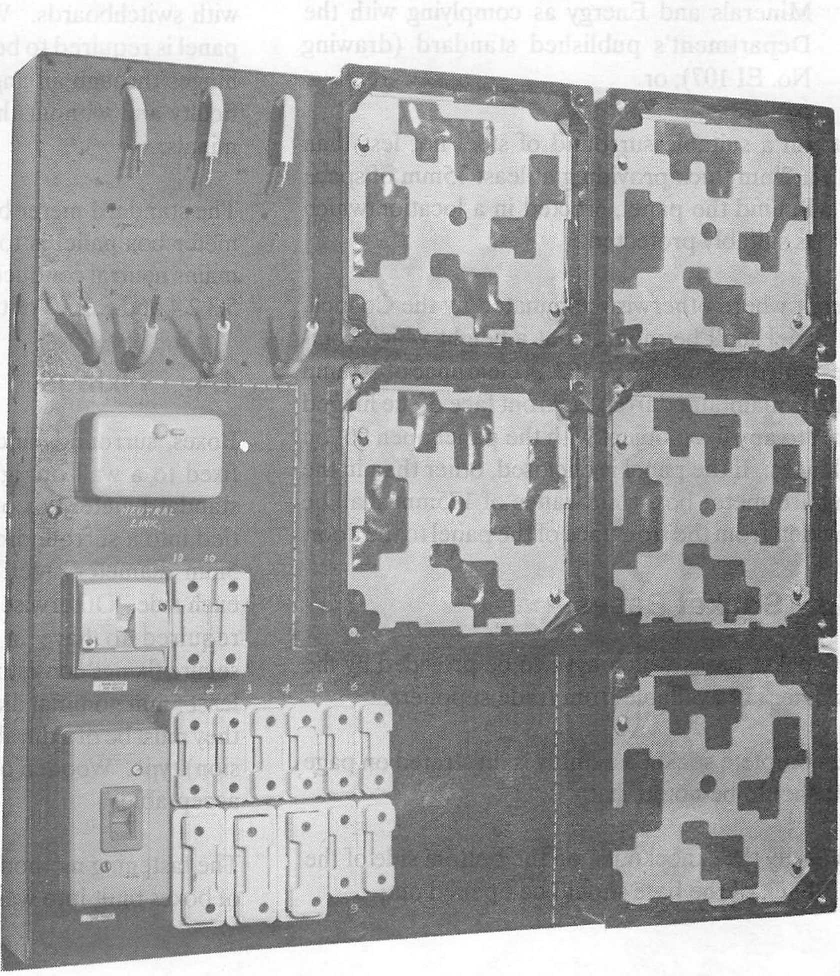
4.4. Fixings.

Boxes, surrounds and enclosures shall be securely fixed to a wall or rigid supporting structure. The standard meter box or equivalent enclosure may be tied into a surrounding brick wall with at least four 5mm diameter steel bolts or equivalent straps on each side. Otherwise, the meter box or surround is required to have at least four, well-spaced and secure fixings consisting of steel screws or bolts of at least 5mm nominal diameter. If wall plugs are used, they must be of a durable (preferably metallic expansion) type. Wooden or vegetable-fibre plugs are not acceptable.

The fastening method used shall, with the exception of boxes built into walls, permit easy removal.


SAMPLE
SAMPLE
SAMPLE
SAMPLE
NEUTRAL LINK

Left -
Department of Minerals and Energy standard hinged panel mounted on 578mm x 565mm x 75mm surround in a protected location. The panel is equipped for 3 phase installation with a single phase off-peak controlled load.


NEUTRAL LINK

Right -
Typical example of a panel as required to be left by contractor before lodging a Ready for Test Certificate.

4.5. Protection from Weather, etc.

The customer is required to take any necessary action to prevent the Council's equipment being affected by weather, mechanical damage and salty, dusty or corrosive atmospheres or exposed to vandalism.

Where a box is used for this purpose, it shall be not inferior in durability, weather-tightness or any other respect to the Department of Minerals and Energy standard meter box and shall be provided with a hinged door and catch. If the door is hinged on the top edge, a stay fastened to the box is required for holding it in a wide-open position.

It is preferred that the door is not glazed. Glazed doors will not be accepted where the box is installed in a position where direct sunlight may enter it or there is considered to be an undue risk of glass breakage.

Any clearances required by the Council shall be maintained around the Council's equipment.

4.6. Accessibility.

Adequate space is required in front of the standard panel for the Council's officers to read meters and work safely and without difficulty. In this regard, the space between any wall on which the service equipment is mounted and any obstruction is required to be not less than 0.9 metre.

The Council requires immediate access during normal business hours to all meters and service equipment on customer's premises. In commercial, industrial and similar premises which are always attended during normal business hours, no objection will be raised to such equipment being located in a lockable enclosure, the key to which is readily available when required.

In domestic premises, or in any premises not always attended during normal business hours, it is preferred that entry to the enclosure containing the Council's service equipment, and the access route to it from the street, not be locked. However, where locking of the enclosure and/or access route is considered desirable or essential, it will be acceptable subject to compliance with the following requirements:-

- Only locks which can be opened by a key carried by Council officers may be used. Standard padlocks, nightlatches and cylinders for nightlatches may be purchased at the Customer Supply and Services offices at Area and District Establishments. Where electrically operated security locking is used, a key switch is to be provided and fitted with the Council's standard cylinder.
- Where access is given by means of a security card, either a key switch as above, or a card left in a locked box which can be opened by a Council key is to be provided
- The areas protected by such locks shall be restricted to those necessary to enable the Council's officers to gain access to the service equipment. The locks shall not be installed on doors which give access to any rooms or areas in which portable articles and equipment of value, personal goods and the like are located.
- The access arrangements shall not require the Council's officers to reset security alarms.
- The access area shall be adequately lit, free of obstructions such as stored materials, equipment, etc., or hazards such as a guard dog.

4.7. Temporary Supply

All temporary supplies up to 100A per phase are to be metered using socket meters.

5. SEALING

The customer shall enclose connections and make provision in an approved manner for the Council's officer to affix seals in accordance with Service and Installation Rule 4.1.4. In a domestic or small installation this will generally involve the use of a suitable sealable link, and, if applicable, a sealable off-peak load contactor and control switch.

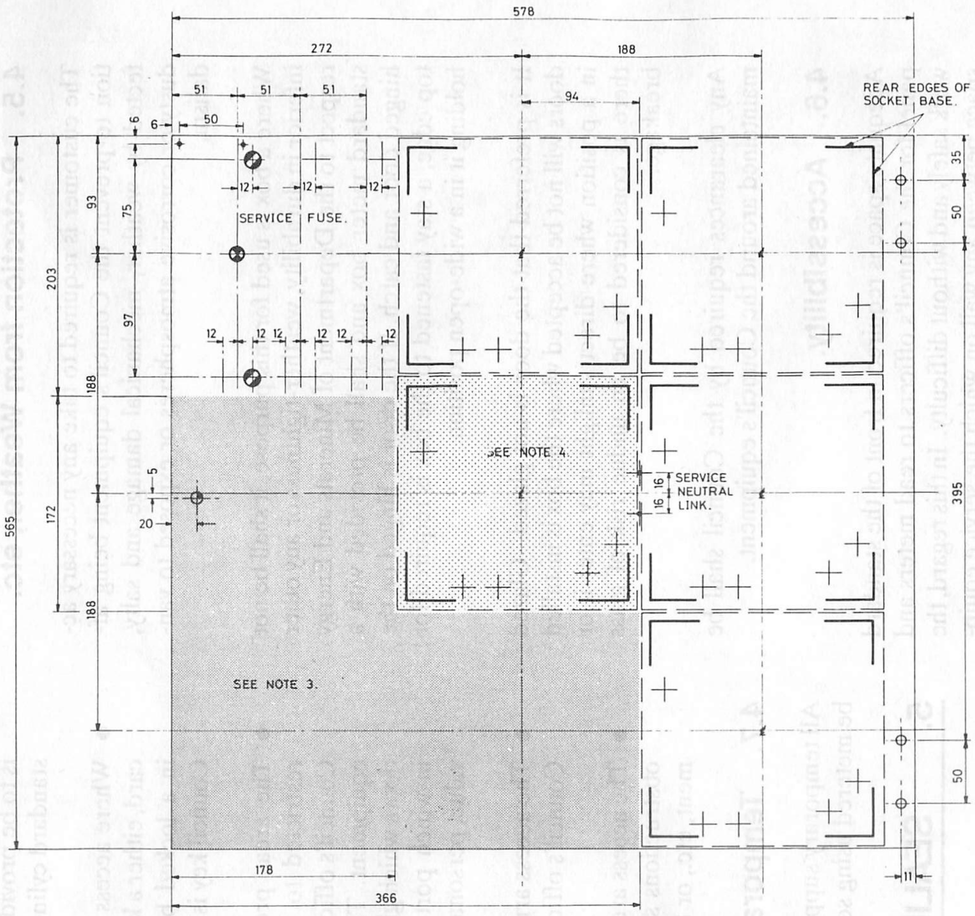
6. DRAWINGS

The following drawings form part of this document:

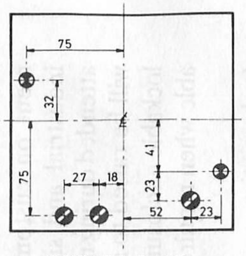
EI 103	-	Standard Meter Box Panel - Drilling Details and Height Limitations
EI 104	-	Standard Meter Box Panel - Diagram of Connections

The following drawings published by the Department of Minerals and Energy are also available upon request at the Council's Customer Supply and Services offices.

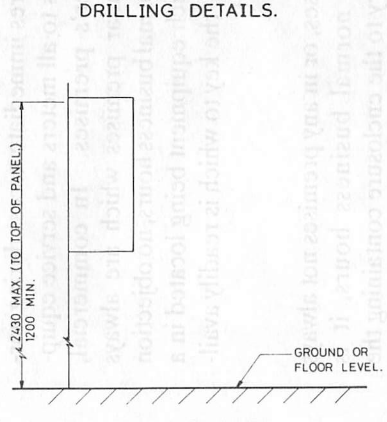
EI 107	-	Department of Minerals and Energy Standard Meter Box Construction Details.
EI 108	-	Department of Minerals and Energy Standard Meter Box Panel Drilling Details.


578
272
188
94
51
51
51
50
6
12
REAR EDGES OF SOCKET BASE.
35
50
93
75
203
97
SERVICE FUSE.
188
172
565
5
20
SEE NOTE 4.
SERVICE NEUTRAL LINK.
16
395
188
SEE NOTE 3.
50
178
366
11

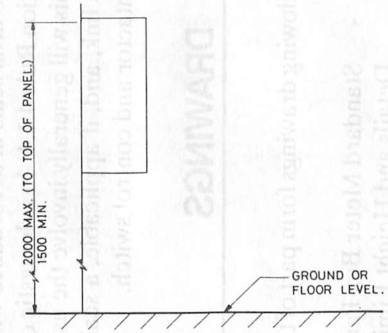
DRILLING DETAILS — FRONT ELEVATION.


75
32
75
27
18
41
23
52
23

SOCKET BASE DRILLING DETAILS.


2430 MAX. (TO TOP OF PANEL.)
1200 MIN.
GROUND OR FLOOR LEVEL.

NON DOMESTIC.


2000 MAX. (TO TOP OF PANEL.)
1500 MIN.
GROUND OR FLOOR LEVEL.

DOMESTIC.

NOTES.

1. GENERAL. THIS PANEL MAY BE INSTALLED IN AN E.A. OF N.S.W. STANDARD METER BOX OR ON A 1·2 mm THICK STEEL SURROUND WHICH IS 75 mm TO 150 mm DEEP, AS APPROPRIATE.

   THE DRILLING DETAILS SHOWN ARE FOR A PANEL EQUIPPED WITH 3 SERVICE FUSES, A SERVICE NEUTRAL LINK ON THE BACK OF THE PANEL AND 5 SOCKET BASES.

   E.A. OF N.S.W. STANDARD METER BOX PANELS WILL GENERALLY HAVE HOLES ADDITIONAL TO THOSE SHOWN TO SUIT THE REQUIREMENTS OF OTHER SUPPLY AUTHORITIES. ONLY THOSE PILOT HOLES NECESSARY FOR THE INSTALLATION CONCERNED SHOULD BE DRILLED OUT TO THE SIZES INDICATED IN THIS DRAWING.

2. FIXINGS FOR SOCKET BASES. THESE ARE REQUIRED TO BE M4 x 35 mm MACHINE SCREWS AND NUTS.

3. SPACE FOR CUSTOMER'S EQUIPMENT. THE AREA INDICATED IS INTENDED FOR THE CUSTOMER'S EQUIPMENT.

4. ADDITIONAL SPACE FOR CUSTOMER'S EQUIPMENT. THE AREA INDICATED MAY BE USED FOR THE CUSTOMER'S EQUIPMENT PROVIDED 3 PHASE SUPPLY IS NOT LIKELY TO BE REQUIRED IN THE FUTURE.

5. FURTHER INFORMATION. SEE DOCUMENT E.I.7 - PROVISIONS FOR SERVICE EQUIPMENT IN SINGLE DOMESTIC AND SMALL INSTALLATIONS.

DRILLING LEGEND.

⊘ 10 mm DIAMETER. (CABLING.)
○ 5·5 mm DIAMETER. (HINGES).
◔ 7 mm DIAMETER. (PANEL FIXING SCREW).
• 3 mm DIAMETER. (PILOT HOLES).
⊗ 5·0 mm DIAMETER. (EQUIPMENT FIXING).

REFERENCE DRAWINGS.

E.A. OF N.S.W. STANDARD METER BOX CONSTRUCTION DETAILS. (E.I. 107)	A2-54250
E.A. OF N.S.W. STANDARD METER BOX PANEL DRILLING DETAILS. (E.I. 108)	B1-55961
STANDARD METER BOX PANEL LAYOUT AND DIAGRAMS OF CONNECTIONS. (E.I. 104)	A2-55729

AMENDMENT
A. NEW TRACING MADE TO SUIT METRIC PANEL AND SOCKET METERING. 9-6-78.
P.Th.

SCC
THE SYDNEY COUNTY COUNCIL

UNLESS OTHERWISE STATED ALL DIMENSIONS ARE IN MILLIMETRES.

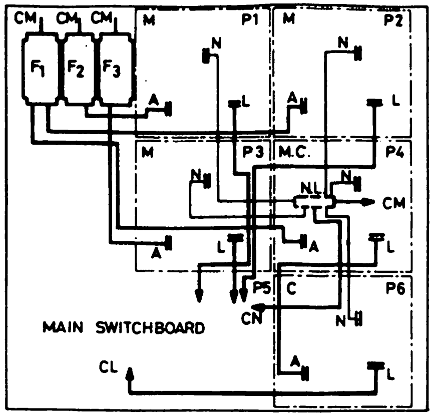
STANDARD METER BOX PANEL.

DRILLING DETAILS AND HEIGHT LIMITATIONS.

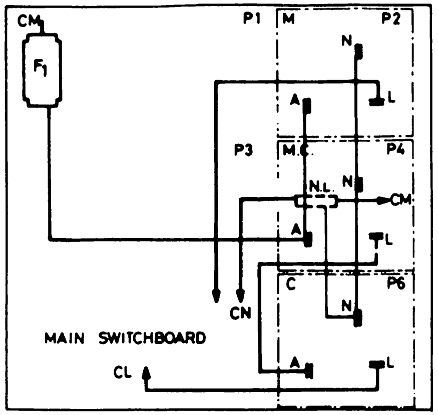
REFERENCE NUMBER
E.I. 103.

SIZE.	NUMBER.	AMD.
A1	43166	

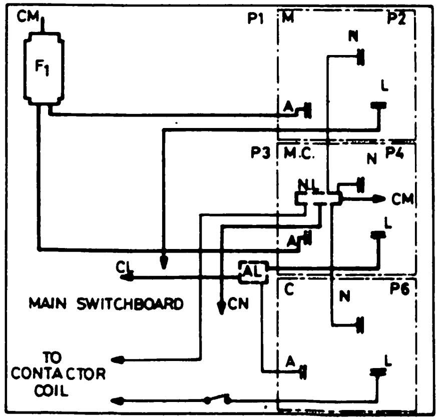
G.C.T.



TYPICAL INSTALLATION
USING SEPARATELY WIRED SOCKETS



TYPICAL INSTALLATION
USING FACTORY-ASSEMBLED
BUSBAR-INTERCONNECTED SOCKETS



TYPICAL SINGLE PHASE
INSTALLATION WITH.
CUSTOMER'S CONTACTOR TO
CONTROL OFF-PEAK LOADS.

LEGEND

A - ACTIVE TERMINAL OF SOCKET

C - SOCKET FOR COUNCIL'S LOAD-CONTROL DEVICE

F - SERVICE FUSES.

L-- LOAD TERMINAL OF SOCKET.

M - SOCKET FOR METER

MC -SOCKET FOR CONTROLLED LOAD METER.

N - NEUTRAL TERMINAL OF SOCKET.

AL- SEALABLE ACTIVE LINK

NL- SERVICE NEUTRAL LINK ON BACK OF PANEL

P - SOCKET POSITIONS. (SEE NOTE 1.)

CN- CONNECTION TO CUSTOMER'S MAINS NEUTRAL BAR.

CL- CONNECTION TO CONTROLLED-LOAD MAIN SWITCH OR CONTACTOR.

CM- CONSUMERS MAINS

NOTES:

1. ARRANGEMENT OF SOCKET BASES.
   (a) THE LOAD CONTROL DEVICE AND METER FOR OFF-PEAK TARIFF ARE REQUIRED TO OCCUPY SOCKET POSITIONS P6 AND P4 RESPECTIVELY. (IF A SECOND OFF-PEAK TARIFF IS REQUIRED SOCKET POSITIONS P5 AND P3 ARE TO BE USED.)
   (b) THE FIRST METER FOR THE PRINCIPAL TARIFF IS TO OCCUPY POSITION P1 OR P2.

2. SERVICE FUSES AND NEUTRAL LINK. THE COUNCIL'S OFFICER INSTALLS THE SERVICE FUSE(S) ON THE FRONT OF THE PANEL AND THE NEUTRAL LINK ON THE BACK IN THE POSITIONS SHOWN ON DRAWING REF. E.I. 103. THIS LINK HAS PROVISION FOR CONNECTING TWO 16mm^2 CABLES (ONE FOR THE CONSUMERS MAINS AND THE OTHER FOR THE CONNECTION TO THE CUSTOMER'S NEUTRAL LINK) AND EIGHT 4mm^2 CABLES (FOR CONNECTIONS TO SOCKET BASE "N" TERMINALS AND TO THE OPERATING COIL OF THE CONTROLLED LOAD CONTACTOR, IF PROVIDED).

3. WIRING. THE WIRING OF ALL EQUIPMENT MOUNTED ON THE PANEL SHALL BE IN THERMOPLASTIC OR ELASTOMER INSULATED STRANDED COPPER CONDUCTOR CABLE INSTALLED IN ACCORDANCE WITH THE SAA WIRING RULES AND GENERALLY NOT EXCEEDING 16mm^2. 4mm^2 CABLE SHALL BE USED FOR THE CONNECTIONS BETWEEN THE SERVICE NEUTRAL LINK AND EACH SOCKET BASE. THE FREE LENGTH OF CONSUMERS MAINS TO BE INSTALLED, MEASURED FROM WHERE IT PASSES THROUGH THE HOLE IN THE PANEL SHALL BE AS FOLLOWS:
   ABOVE THE FUSE (LINE SIDE) 75mm
   BELOW THE FUSE (LOAD SIDE) 150mm
   A SIMILAR LENGTH IS REQUIRED FOR THE NEUTRAL CONDUCTOR. ALL CABLES TO BE CONNECTED TO THE SERVICE FUSE(S) AND NEUTRAL LINK (OTHER THAN THE INCOMING CONSUMERS MAINS) SHALL HAVE THEIR ENDS BARED AS FOLLOWS BY THE CUSTOMER'S CONTRACTOR READY FOR CONNECTION BY THE COUNCILS OFFICER:-
   SERVICE FUSE - 20mm
   SERVICE NEUTRAL FUSE - 10mm
   REFER TO E.I. 7 IF CONSUMERS MAINS LARGER THAN 16mm^2 ARE TO BE INSTALLED.

4. USE OF CONTACTORS. SERVICE RULE 3.9 REQUIRES THE CUSTOMER TO INSTALL A CONTACTOR AND ASSOCIATED WIRING WHERE THE CONTROLLED LOAD EXCEEDS 25A OR INVOLVES THE SWITCHING OF MORE THAN ONE PHASE OF SUPPLY THE CONTACTOR MUST BE LOCATED AT THE METER POSITION WITH A SWITCH CONTROLLING THE CONTACTOR COIL. THE SWITCH AND CONTACTOR COVERS ARE TO BE SEALABLE.

5. FURTHER INFORMATION. SEE PUBLICATION E.I 7 - PROVISION FOR SERVICE EQUIPMENT IN SINGLE DOMESTIC AND SMALL INSTALLATIONS

REFERENCE DRAWINGS.

E.A. OF N.S.W. STANDARD METER BOX CONSTRUCTION DETAILS. (E.I. 107)	A2 - 54250
E.A. OF N.S.W. STANDARD METER BOX PANEL DRILLING DETAILS. (E.I. 108)	B1 - 55961
STANDARD METER BOX PANEL DRILLING DETAILS AND HEIGHT LIMITATIONS. (E.I. 103)	A1 - 43166

AMENDMENT

STANDARD METER BOX PANEL
LAYOUT AND
DIAGRAMS OF CONNECTIONS

REFERENCE NUMBER
E.I. 104

SIZE	NUMBER	AMD
A2	55729	5

NOTES

SYDNEY
COUNTY
COUNCIL

No. E.I. 8

SEPTEMBER, 1981

Provisions For Service Equipment In Multiple Installations

CONTENTS

1. SCOPE.

2. GENERAL REQUIREMENTS.

3. CONNECTION TO THE PREMISES.
   - 3.1 AERIAL SERVICE LINES.
   - 3.2 UNDERGROUND SERVICE CABLES.

4. SERVICE FUSES AND NEUTRAL LINKS.
   - 4.1 INSTALLATION ARRANGEMENTS.
     - 4.1.1 On Meter Panel.
     - 4.1.2 On Separate Board Installed by S.C.C.
     - 4.1.3 On Separate Panel Installed by Customer.
     - 4.1.4 Service Fuse Cabinet.
   - 4.2 MOUNTING BATTENS.
   - 4.3 ACCESSIBILITY AND PROTECTION.
   - 4.4 CONNECTIONS AT SERVICE FUSES AND NEUTRAL LINK.
     - 4.4.1 General.
     - 4.4.2 Services of Up to 100A Rating.
     - 4.4.3 Service Fuse Cabinet.

5. METERS.
   - 5.1 INSTALLATION.
   - 5.2 GROUPING.
   - 5.3 ACCESSIBILITY.
     - 5.3.1 Unsuitable Mounting Locations.
   - 5.4 PROTECTION FROM WEATHER, ETC.
   - 5.5 MOUNTING PROVISIONS.
     - 5.5.1 Module System.
     - 5.5.2 Mounting, Arrangement and Wiring of Socket Bases.
     - 5.5.3 Fixings.
     - 5.5.4 Socket Bases.
   - 5.6 ARRANGEMENT OF METERING INSTALLATION.
     - 5.6.1 Separate Protective Device for Each Meter.
     - 5.6.2 A Group of Meters Connected to One Protective Device.

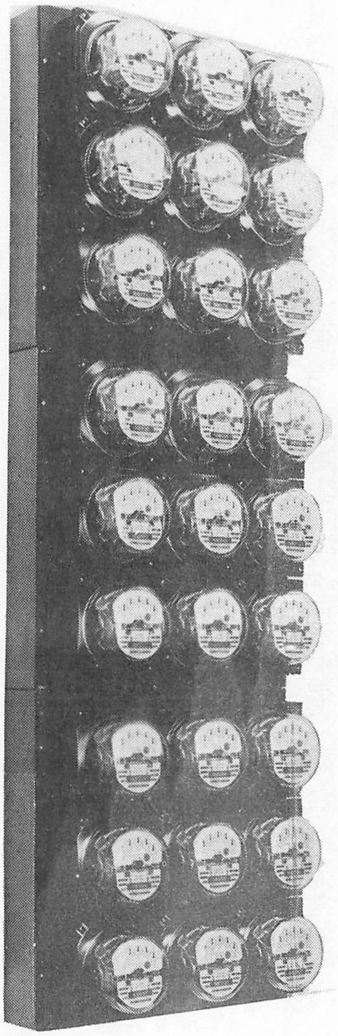
6. SEALING OF UNMETERED EQUIPMENT.

7. SPACING BETWEEN METERS AND CURRENT-CARRYING CONDUCTORS.
   - 7.1 MULTI-CORE CABLES AND BUNCHED SINGLE-CORE CABLES.
   - 7.2 SPACED SINGLE-CORE CABLES, BUSWAYS OR BUSBARS.
   - 7.3 SHIELDING.
   - 7.4 SPECIAL CASES.

8. LABELLING.

9. DRAWINGS.

10. ISSUE DATE.



SYDNEY
COUNTY
COUNCIL

No. E.I. 8

SEPTEMBER, 1981

Provisions For Service Equipment In Multiple Installations

1. SCOPE

This publication sets out the provisions which Council's officers will generally require an applicant for supply to make in accordance with the Council's Service and Installation Rules for the installation of service equipment, such as service fuses and neutral links, plug-in meters and load control devices in premises where use cannot be made of the Energy Authority of N.S.W.'s standard meter box panel. It is applicable to blocks of home units and flats, groups of small shops and factory units and separately metered portions of large installations.

To meter loads in excess of approximately 100A/phase, it is necessary to use meters which operate in conjunction with current transformers and reference should be made to publication E.I. 18 - "Metering Which Requires the Use of Current Transformers" for the additional provisions which the customer is required to make.

The proposed arrangements will generally be briefly stated in a written notification following the receipt of an application for supply.

2. GENERAL REQUIREMENTS

The applicant for supply, referred to in the following as the "customer", is required to provide mounting and installation facilities for the Council's service equipment in the positions selected by the Council's officer.

In all installations which fall within the scope of this publication, the Council requires the following facilities to be provided by the customer.

3. CONNECTION TO THE PREMISES

3.1 AERIAL SERVICE LINES. The Council's officer will determine the route of the service line and the position of the point of attachment to a building or structure. Provisions which must be made by the customer are set out in publication E.I. 15 - "Aerial Service Lines".

3.2 UNDERGROUND SERVICE CABLES. Underground service cables are generally installed only in areas where the street mains are already underground. The Council's officer will determine the position of entry of the service cable at the property boundary and its route on the property. The customer shall provide, install and maintain a conduit or set of conduits and any associated facilities required by the Council for the installation of the service cable. Provisions which must be made by the customer are set out in publication E.I. 17 - "Underground Service Cables in Installations Larger Than Single Domestic".

4. SERVICE FUSES AND NEUTRAL LINKS

4.1 INSTALLATION ARRANGEMENTS

The Council provides and installs the service fuses and the service neutral link.

4.1.1 On Meter Panel. Where the Council's officer determines that supply will be provided from 100A service fuses and it is intended that they be mounted on a meter panel as described in Clause 5.5.2, the fuses will be installed at the top left hand corner of the panel. The connecting cables shall be not larger than 16mm^2. The service neutral link may be located on the front of the panel or, if of the hinged type, on the back. The panel shall be predrilled by the customer in accordance with Drawing Ref. No. E.I. 105.

4.1.2 On Separate Board Installed by S.C.C. Where it is not practicable to install 100A service fuses on the meter panel, the Council installs a board with service fuses and neutral link, on battens as described in Clause 4.2.

4.1.3 On Separate Panel Installed by Customer. The customer may prefer to install a separate panel for mounting the 100A service fuses and neutral link. Provided this arrangement is agreed to, the customer may arrange for installation of the panel and wiring in accordance with Drawing Ref. No. E.I. 115.

4.1.4 Service Fuse Cabinet. Where the Council's officer determines that supply will be provided from a service rated in excess of 100A and up to 400A per phase, the Council installs a service fuse cabinet on battens as described in Clause 4.2.

4.2 MOUNTING BATTENS. Where battens are called for as referred to in Clauses 4.1.2 and 4.1.4, they are required to be of softwood, 40mm x 40mm finished size, supplied and fixed vertically to a wall by the customer. The requirements regarding location and arrangement of the battens will be indicated on the notice issued by the Council's officer.

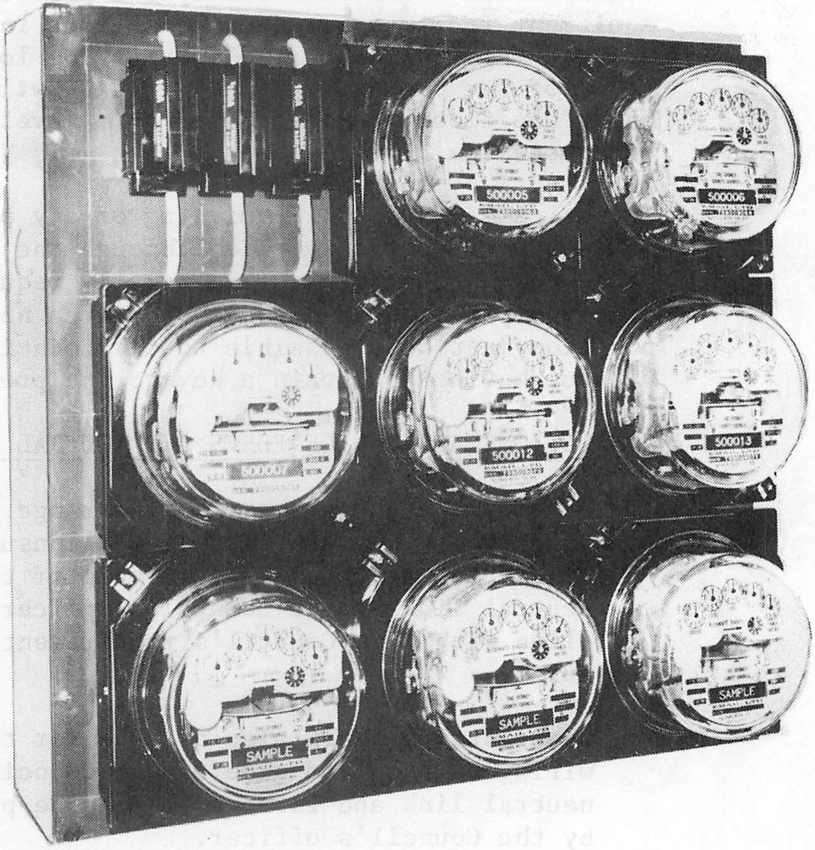

500005
500006
500007
500012
500013
SAMPLE
SAMPLE
SAMPLE

ILLUSTRATION 1.
ONE MODULE OF A MULTIPLE INSTALLATION METER PANEL HINGED ON A METAL SURROUND WITH SERVICE FUSES INSTALLED.

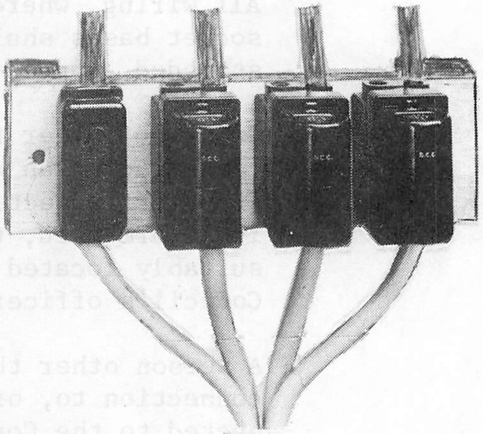


ILLUSTRATION 3.
100A SERVICE FUSES ON SEPARATE BOARD.
(See Clause 4.1.2).

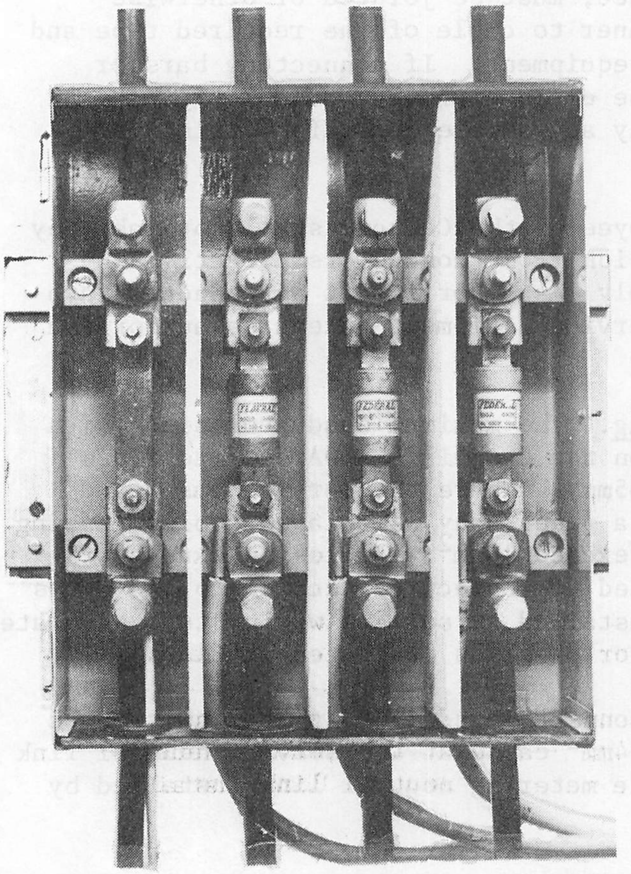


ILLUSTRATION 2.
S.C.C. 100A TO 400A SERVICE FUSE CABINET SHOWING TERMINATION OF CONSUMERS MAINS AND A METERING NEUTRAL LINK CONNECTION.
(See Clause 4.1.4).

4.3 ACCESSIBILITY AND PROTECTION. In addition to complying with the requirements for accessibility and protection of the Council's equipment from weather etc. as set out in Clauses 5.3 and 5.4, the service fuses and neutral link must be located at the street access level of the building. Consideration will be given to the location being one floor above or below this level only in exceptional circumstances.

In the case of a public building or any premises occupied by a number of customers supplied through the same service, the service fuses and neutral link are generally requested to be located in a suitable position in a common-use area near an entrance. The position must be accessible to the Council's officers at all hours without having to obtain a key to the premises.

4.4 CONNECTIONS AT SERVICE FUSES AND NEUTRAL LINK

4.4.1 General. The customer shall arrange for the installation of a sufficient length of suitable consumers mains cable for connection at the line terminals of the service fuses and neutral link by the Council's officer in a manner which complies with this Council's requirements and the S A A Wiring Rules.

The customer shall also arrange for the installation of similar wiring on the load side of the Council's service fuses and neutral link and for the ends to be prepared ready for connection by the Council's officer.

All wiring, where connected to service equipment and associated socket bases shall be 0.6/1kV grade P.V.C. or elastomer-insulated stranded, copper-conductor cable of not less than 4mm^2.

Cables of other types, if used, must be jointed or otherwise connected in an approved manner to cable of the required type and size for connection to this equipment. If connecting bars or links are used, they shall be of an approved sealable type, suitably located to be easily accessible for safe working on by Council's officers.

A person other than an employee of the Council shall not make any connection to, or disconnection from, conductors directly connected to the Council's supply system or insert a conductor into any item of the Council's service equipment except as authorised by the General Manager.

4.4.2 Services of Up to 100A Rating. The maximum conductor size which can be terminated directly on the Council's 100A service fuses or service neutral link is 35mm^2. Where the service fuses and neutral link are mounted on a panel, any associated cables passing through the panel shall not exceed 16mm^2. Cables in excess of 16mm^2 and up to 35mm^2 intended for direct connection to the fuses and neutral link shall be installed as surface wiring to a separate service fuse mounting board or panel as indicated in Clause 4.1.

The Council is prepared to connect in addition to the customer's main neutral conductor, one 4mm^2 cable at the service neutral link to form the connection to the metering neutral link installed by the customer.

The Council is also prepared to connect one additional cable on the load side at each service fuse to supply a separately metered portion of the installation. Where more than two such portions of the installation have to be supplied from one service fuse, the customer is required to provide a connecting bar or link of an approved sealable type, suitably located to be easily accessible for safe working on by Council's officers.

4.4.3 Service Fuse Cabinet. Where the maximum demand is assessed at more than 100A and up to 400A per phase, the Council generally installs a service fuse cabinet. Consumers mains of up to 185mm^2 copper cables can be terminated in the clamp-type lugs which are supplied with the cabinet. One additional cable per phase (16mm^2 min. and 35mm^2 max.) attached to an approved flag-type lug suitable for installation under the main cable lug may be arranged for connection to each load terminal of the cabinet. Such additional cables must be installed with protective devices supplied and installed by the customer as close as practicable to the service fuse cabinet. The protective devices are required to comply with Clause 5.6.2.

In addition to the customer's main neutral conductor, one 4mm^2 cable may be arranged for connection at the service neutral link within the cabinet to form the connection to the metering neutral link installed by the customer.

Where larger cables or more than one cable per phase have to be terminated for connection to the service cabinet, the customer is required to provide the means for their termination. This may be by the attachment of special lugs complying with certain limiting dimensions (See Drawing Ref. No. E.I. 110) or the provision of 31.5mm x 6.3mm copper connection bars or the equivalent to provide suitable terminating facilities external to the cabinet. If the copper bars are used, each bar shall have a 14mm dia. hole on the centre line, 15mm from the end, to facilitate its connection within the cabinet.

Terminals arranged for the connection of cables external to the service fuse cabinet shall form part of approved sealable connecting bars or links or be enclosed within one or more sealable non-conducting enclosures. Covers shall be so secured that they may be removed if necessary by means of a screwdriver or spanner. A typical arrangement of consumers mains, terminations and connections to the Council's service fuse cabinet showing general requirements to be provided by the customer is shown in Drawing Reference No. E.I. 110.

It is to be noted that all conductors terminating in the service fuse cabinet must be arranged to enter the cabinet as near as practicable to the centre lines of the cable entry holes in the insulating barriers of the cabinet as shown in Section BB, Drawing Reference No. E.I. 110.

Where aluminium cables are to be terminated, approved methods of jointing and terminating them to meet the requirements of Clause 3.21.4 of the S A A Wiring Rules are set out in the S A A Document 3000R "Rulings to the S A A Wiring Rules".

5. METERS

5.1 INSTALLATION. The Council provides and installs the meters appropriate for the number of separately-metered occupancies in the premises and for the tariffs selected. In new metering installations, energy metering of loads assessed at up to 100A is required to be by means of single phase plug-in type meters and control equipment for which the customer must provide and install the required number of fully wired socket bases.

Where supply is taken at a demand tariff or current transformer metering is used, the customer is required to provide and erect a standard panel for the meters and in the latter case, facilities also for installing and connecting the current transformers. Requirements relating to current transformer metering are given in publication E.I. 18 - "Metering Which Requires the Use of Current Transformers".

Where additional meters and control devices can be accommodated on an existing meter board which has been provided by the Council, the Council's officer will fix such instruments to the board and connect them to the wiring installed for the purpose by the customer.

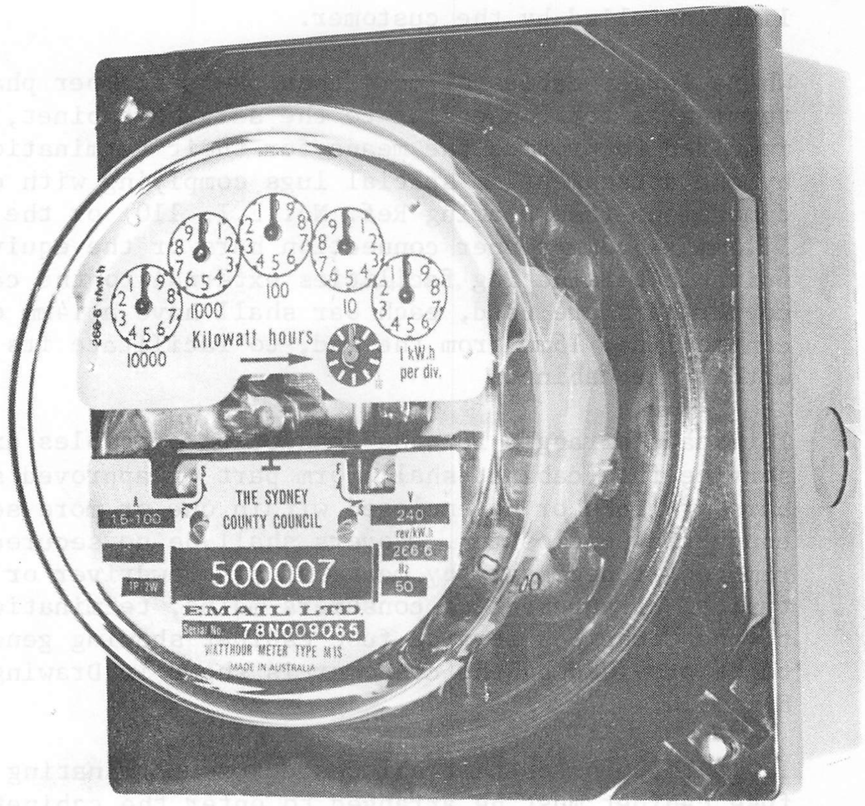

10000
1000
100
10
Kilowatt hours
1 kW.h per div.
THE SYDNEY COUNTY COUNCIL
15-100
240
266.6
50
500007
EMAIL LTD
78N009065
WATTHOUR METER TYPE M1S
MADE IN AUSTRALIA

ILLUSTRATION 4. ENERGY METER PLUGGED INTO THE CUSTOMER'S SOCKET BASE AND SECURED BY A RETAINING RING SUPPLIED BY THE COUNCIL.

5.2 GROUPING. It is preferred, in general, that all meters be located at the one metering position which is also the location of the service fuses and neutral link. However, consideration will be given to any request for a metering position within a common property area on each floor of a multi-storey building occupied by separate customers, and also in a suitable location at each shop or other business premises in a development which covers a large area.

Where it is necessary to connect more than one set of meters to one point of supply and also in multiple-occupancy buildings where changes in tenancy may require alterations to the portions of the installation connected to meters, links may be installed by the customer, in order to facilitate changes to metering arrangements. Such links must comply with the Council's requirements, be readily-accessible and suitable for sealing by the Council. They may be located on the back of a hinged meter panel.

5.3 ACCESSIBILITY. Adequate space is required in front of the meter panel and service fuse panel or cabinet for the Council's officers to read meters and work safely and without difficulty. In this regard the space between any wall on which service equipment is mounted and any other wall or obstruction in front of the panel is generally required to be not less than 1 metre. To provide for temporary testing equipment, the clear area in front of the meter panel shall not be less than 2 square metres.

The Council requires unrestricted access during normal business hours to all meters and service equipment on customers' premises. In commercial, industrial and similar premises which are always attended during normal business hours, no objection will be raised to such equipment being located in a lockable enclosure, the key to which is readily available when required. In domestic premises, it is preferred that entry to the enclosure containing the Council's service equipment, and the access route to it from the street, be unrestricted. Where locking of the enclosure and/or access route is considered desirable or essential, it will be acceptable subject to compliance with the following requirements.

i) Only locks as supplied by the Council and to which Council officers also hold keys, may be used. These locks, which are available in a variety of types, may be purchased at the Customer Supply and Services offices at Area and District Establishments.

ii) The areas protected by such locks shall be restricted to those necessary to enable the Council's officers to gain access to the service equipment. The locks shall not be installed on doors which give access to any rooms or areas in which portable articles and equipment of value, personal goods and the like, are located or stored for safekeeping.

iii) The access area shall be adequately lit, free of obstructions such as stored materials, equipment, etc., or hazards such as a guard dog.

5.3.1 Unsuitable Mounting Locations. In general, the following locations are considered unsuitable for mounting metering and other service equipment:-

i) Over stairways, ramps, in narrow passageways or in other confined spaces.

ii) Vehicle docks, driveways and factory passageways where the equipment or the person working on it would not be effectively protected.

iii) Positions in close proximity to or over machinery or open-type switchgear.

iv) Locations where the atmosphere is liable to be affected by fumes, dampness or dust of such a nature as may cause deterioration of equipment or unsatisfactory working conditions.

v) Hazardous locations as defined in the SAA Wiring Rules.

vi) Where the normal ambient temperature exceeds 30°C.

vii) Where there is insufficient light.

viii) Where the use of a stepladder would be hazardous.

Any elevated floor or platform used to provide access shall be substantial and permanent and shall be fitted with a railing where considered necessary by the Council's officer. Access to such elevated positions shall be provided by an approved fixed stairway equipped with a handrail.

It should be noted that further requirements are imposed by Ordinance 70 under the Local Government Act where such equipment is located near any exit defined as a "required exit" to the building including the passageways leading to such exit.

Where service equipment has to be installed in such locations, it must be installed in a fire-resistant enclosure so located that a specified clear passageway width exists as required for the type of building, its proposed use and occupancy. Compliance with the Ordinance in this regard is supervised by local Councils. Accordingly, any proposal for locating mounting facilities for this Council's meters or other service equipment in or near any exit to a building, must be submitted by the customer to the local Council concerned for approval before any associated construction or installation work is commenced.

5.4 PROTECTION FROM WEATHER, ETC. The customer is required to take whatever action is considered by the Council's officer to be necessary to prevent the Council's equipment being affected by weather, mechanical damage and salty, dusty or corrosive atmospheres.

Where a box is used for this purpose, it shall not be inferior in durability, weather-tightness or any other respect to the Energy Authority of N.S.W's standard meter box and shall be provided with a hinged door and catch. If the door is hinged on the top edge, a stay fastened to the box is required for holding the door in a wide-open position. Doors shall not be glazed if the box is installed where sunlight may enter it or there is considered to be an undue risk of glass breakage. Any clearances notified by the Council's officers shall be maintained around the Council's equipment.

5.5 MOUNTING PROVISIONS. For installations with demands up to 100A per phase, the Council's officer will generally include in the notification to the applicant for supply, the requirement to provide an arrangement of fully wired socket bases for the mounting of the Council's plug-in meters and control equipment. For larger or more complicated installations, he will indicate that further advice will be provided by another officer who will leave a further notification.

5.5.1 Module System. Drawing Ref. No. E.I. 101 which is attached to this publication shows an arrangement of nine socket bases, defined as one module. Multiples of this module will be called for where larger numbers of bases are required. Mounting height limitations, panel drilling details and other requirements are shown on the drawing. It will be noted that the module dimensions will vary according to the mounting system chosen as outlined in Clause 5.5.2. Where a panel is used its dimensions will generally need to be greater than 562mm x 562mm as indicated on the drawing to provide for hinging or other means of fixing the panel.

5.5.2 Mounting, Arrangement and Wiring of Socket Bases

a) Mounting. The requirements for the mounting of socket bases are set out in Drawing Ref. No. E.I. 101. The installation must comply with the S A A Wiring Rules.

Acceptable mounting facilities are outlined as follows:-

i) On a non-metallic, hinged, removable or fixed switchboard panel using construction complying with Clause 2.21 of the S A A Wiring Rules. There must be no permanent deformation of hinged panel supports with the fully loaded panel swinging on its hinges.

Typical construction utilises a 610mm or 600mm square insulating panel hinged on a vertical side and mounted on a surround of 1.2mm thick (1.00mm minimum) zinc coated steel, giving a clear space not less than 75mm deep behind the panel. Hinged panel construction enables the metering neutral link to be located on the back of the panel and gives easy access to the rear of the panel when required. A clearance of 200mm is required from the front face of the panel to any fixed object, with the panel open 90^0.

ii) On 12mm thick waterproof-bonded plywood so mounted as to provide at least 40mm clearance behind the panel.

iii) Directly attached to rails consisting of pairs of 25mm (max.) wide x 12mm deep x 1.5mm thick zinc coated steel channels or the equivalent fixed vertically to a wall or other suitable structure.

a) Mounting (Cont.)

Factory-assembled combinations of socket bases in a vertical arrangement, adequately supported and interconnected by means of busbars and insulating spacers will also be accepted, subject to the manufacturer having previously submitted full details and received the General Manager's approval of the system.

Attention is drawn to the need to ensure that socket bases for meters are not installed in a position where the requirements for separation from heavy current-carrying conductors (See Section 7) would not be complied with.

The customer's electrical equipment may be installed on a meter panel below the lowest row of socket bases. However, it is advisable to allow space for any additional socket bases which may be required later in such installations because of any need for increased supply or the selection of different tariffs.

Adequate clearances and facilities must be provided around any installation of socket bases, however mounted or enclosed, to ensure the socket bases and meters, fixings, wiring and terminals are easily accessible for working on, removal or replacement. Where meters are installed in an enclosure, a minimum clearance of 175mm is required from the mounting surface of the socket bases to the inside face of the enclosure door.

b) Arrangement and Wiring. The wiring connected to socket bases is required to be as set out on Drawing Ref. No. E.I. 102. It shall be carried out in accordance with the SAA Wiring Rules using stranded copper-conductor cable of not less than 4mm^2 or more than 25mm^2. It should be noted that where socket bases are panel mounted and the service fuses and neutral link are to be mounted on the same panel, the wiring passing through the panel for connection to the fuses shall not exceed 16mm^2. See Clause 4.1.

The customer is required to supply and install one or more approved sealable metering neutral bars or links to provide the neutral conductor necessary for each socket base. This neutral bar or link may be installed in a suitable position on the back of a hinged panel. In the case of fixed or removable panels, it shall be installed in a suitable position on the front of the panel or close to it accessible from the front of the panel. In the case of a group of rail-mounted socket bases each metering neutral link is required to be easily accessible and close to the bases. Under no circumstances will any metering neutral bar or link be permitted to be located within a socket base.

Socket bases must be arranged in the same order as the separately metered occupancy numbers starting from the top row of the top module numbering from left to right followed by the next lower row and so forth to the bottom of the column of modules. Where there is a three phase supply at the metering position, meters on the same phase must be vertically in line. Should load control equipment be necessary the socket base for the control equipment is required to be immediately below that for the controlled-load meter, unless otherwise approved.

To achieve load balance in large installations such as multi-storey buildings with various metering positions, it may be necessary to vary the phase order of the supply cables connecting the module or group of modules at each metering position.

5.5.3 Fixings. The requirements regarding fixings for installing the above socket base mounting facilities and for attaching the bases to such facilities are set out in Dwg. Ref. No. E.I. 101.

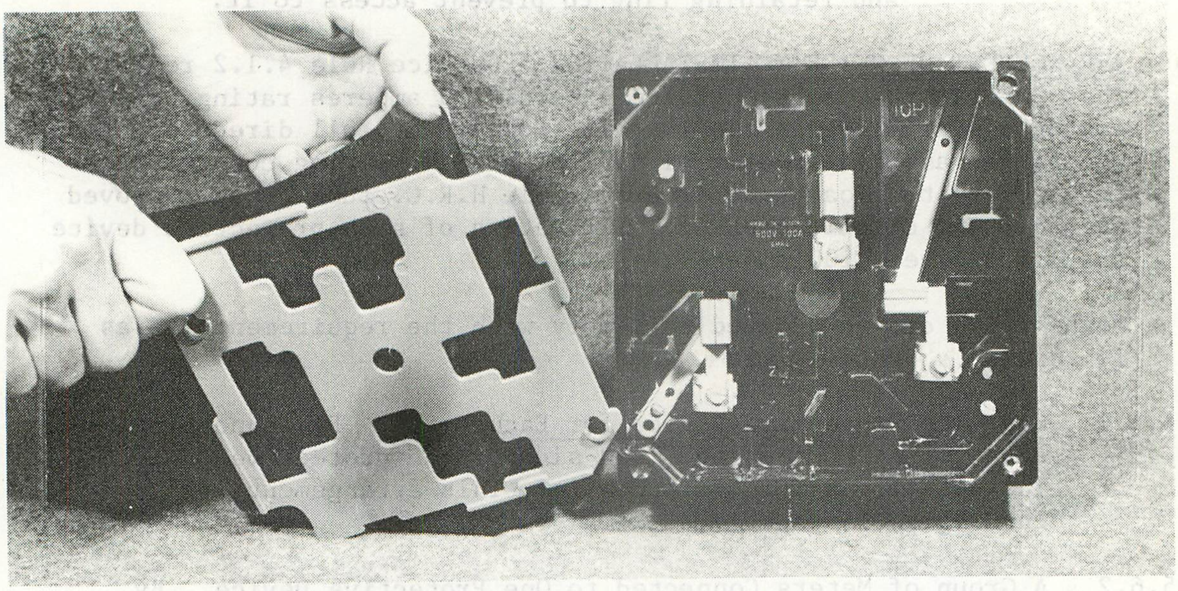


ILLUSTRATION 5. SOCKET BASE ASSEMBLY SHOWING SHIELDING PLATE WITH ADHESIVE MEMBRANE FOR EXCLUDING DUST PENDING INSTALLATION OF METER, JAWS, TERMINAL ASSEMBLIES AND KNOCK-OUTS FOR CABLES.

5.5.4 Socket Bases. The socket bases which have to be provided by the customer are generally available for purchase from trade suppliers and the Council's Area and District Establishment stores and showrooms.

The following spare parts are also generally available:-

Terminal nut and screw assembly.
Shielding plate with temporary plastic membrane.
Screws for attaching shielding plate.

The socket base assembly is illustrated above. It should be noted that:-

i) Only the appropriate "knock-outs" provided in the bases should be opened out.

ii) The terminals provide for the connection of cables of up to $25mm^2$ c.s.a.

iii) The temporary plastic membrane must be left in position under the shielding plate pending the installation of the Council's equipment.

iv) The moulded retaining ring with sealable screws is provided and fitted by the Council's officer when installing the meter or load control device.

v) If it should be necessary to leave a socket connected to the supply without a meter or load control device plugged into it, the Council's officer may install a cover plate and retaining ring to prevent access to it.

5.6 ARRANGEMENT OF METERING INSTALLATION. Service Rule 4.1.2 requires that "where the size of service exceeds 100 amperes rating, the customer shall arrange the installation so that all direct-connected meters and associated control devices and the wiring connected to them are on the load side of a suitable H.R.C. fuse or an approved over-current circuit breaker. The rating of such protective device shall not exceed 100 amperes."

Means which can be adopted to comply with the requirement are as follows:-

5.6.1 Separate Protective Device for Each Meter. By connecting each socket base on the load side of the protective device installed in a main or sub-main. This arrangement is shown in Diagram 1, page 13.

5.6.2 A Group of Meters Connected to One Protective Device. By connecting groups of socket bases on the load side of the protective device in accordance with the following:-

i) "All electric" domestic installations - 4 (max.)

ii) Other domestic installations - Determined by the requirement that the total demand assessed in accordance with the S.A.A. Wiring Rules Table 6 does not exceed 100 A.

iii) Installations other than domestic - Determined by the requirement that the sum of the individual maximum demands, each assessed in accordance with the S.A.A. Wiring Rules does not exceed 100 A.

This arrangement is illustrated in Diagram 2, page 13. It applies also where socket bases are busbar-interconnected.

SCHEMATIC ARRANGEMENT OF CONNECTIONS

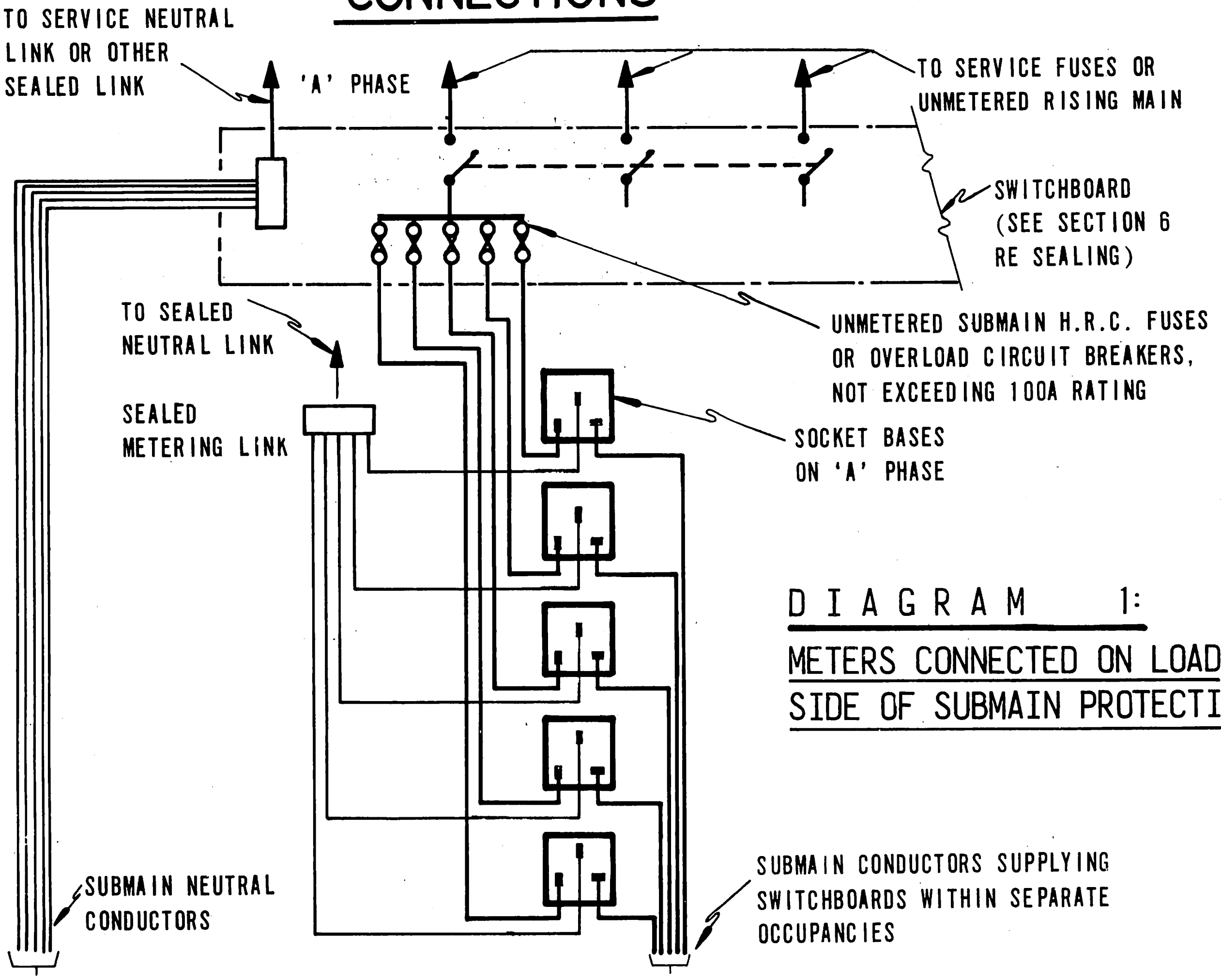

TO SERVICE NEUTRAL LINK OR OTHER SEALED LINK
'A' PHASE
TO SERVICE FUSES OR UNMETERED RISING MAIN
SWITCHBOARD (SEE SECTION 6 RE SEALING)
TO SEALED NEUTRAL LINK
UNMETERED SUBMAIN H.R.C. FUSES OR OVERLOAD CIRCUIT BREAKERS, NOT EXCEEDING 100A RATING
SEALED METERING LINK
SOCKET BASES ON 'A' PHASE
SUBMAIN NEUTRAL CONDUCTORS
SUBMAIN CONDUCTORS SUPPLYING SWITCHBOARDS WITHIN SEPARATE OCCUPANCIES

DIAGRAM 1: METERS CONNECTED ON LOAD SIDE OF SUBMAIN PROTECTION

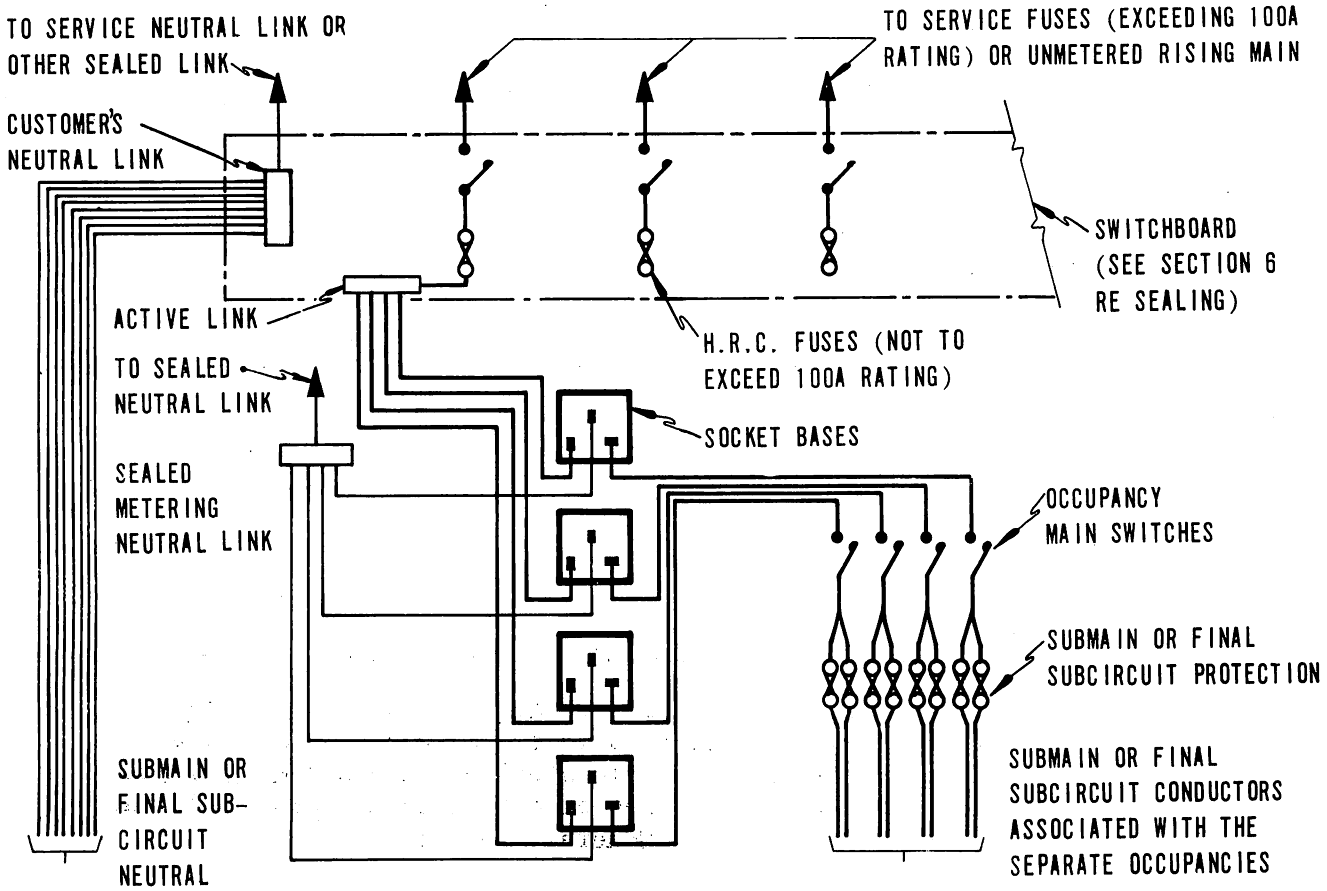

TO SERVICE NEUTRAL LINK OR OTHER SEALED LINK
TO SERVICE FUSES (EXCEEDING 100A RATING) OR UNMETERED RISING MAIN
CUSTOMER'S NEUTRAL LINK
SWITCHBOARD (SEE SECTION 6 RE SEALING)
ACTIVE LINK
H.R.C. FUSES (NOT TO EXCEED 100A RATING)
TO SEALED NEUTRAL LINK
SOCKET BASES
SEALED METERING NEUTRAL LINK
OCCUPANCY MAIN SWITCHES
SUBMAIN OR FINAL SUBCIRCUIT PROTECTION
SUBMAIN OR FINAL SUB-CIRCUIT NEUTRAL CONDUCTORS
SUBMAIN OR FINAL SUBCIRCUIT CONDUCTORS ASSOCIATED WITH THE SEPARATE OCCUPANCIES

DIAGRAM 2: GROUPS OF METERS CONNECTED ON LOAD SIDE OF 100A H.R.C. FUSE

6. SEALING OF UNMETERED EQUIPMENT

In general, the customer is required to suitably enclose and arrange for sealing by the Council all of the equipment installed on the line side of the meters together with all metering connections.

However, it is necessary that the customer be able to replace ruptured fuses without a Council officer attending to remove seals and reseal equipment. This can sometimes be arranged by the use of sealable escutcheon type panels which are available with either front or back-connected fuses or circuit breakers.

Individual items of equipment such as links may be separately sealed but in some cases it may be preferable to provide a sealable cover or panel over equipment to which the customer does not require access for maintenance, etc. Adequate segregation is required between portions of a switchboard which are sealed and those which are not.

7. SPACING BETWEEN METERS AND CURRENT-CARRYING CONDUCTORS

In order to avoid the adverse effect on meters of external magnetic fields, the customer shall, except as otherwise determined by the General Manager, provide and maintain the following minimum spacings between meters and certain current-carrying conductors.

7.1 MULTI-CORE CABLES AND BUNCHED SINGLE-CORE CABLES. Where the separation between all conductors of a circuit is due solely to the solid insulation and sheathing on the conductors, as in multi-core cables or a group of single core cables in flat or bunched formation, there is no special requirement as to spacing.

7.2 SPACED SINGLE-CORE CABLES, BUSWAYS OR BUSBARS. Where the separation between conductors of the same circuit exceeds that in 7.1 but does not exceed 160mm, the minimum spacing between any point on the meter and any point on the nearest conductor of the circuit shall be in accordance with Table 2. Intermediate points may be obtained by interpolation.

TABLE 2

Current in Conductor Nearest to Meter (Amperes)	Minimum Spacing Between Conductor and Meter (Millimetres)
150	Nil
400	500
600	700
1000	900
1500	1200
2000	1400
3000	1700
4000	2000

7.3 SHIELDING. The spacings determined under 7.2 may be reduced by multiplying them by the following factors if the meters or conductors are enclosed in a container made of mild steel of the thicknesses indicated in Table 3. Where other thicknesses or materials are proposed, the factor shall be as determined by the General Manager.

TABLE 3

Thickness of Mild Steel Plate (Millimetres)	Multiplying Factor
5.0	0.25
2.5	0.5
1.2	0.75

7.4 SPECIAL CASES. Spacings in excess of 160mm between the centres of conductors of a circuit should in general be avoided in the vicinity of meters. Where this is not practicable, details should be submitted in writing and the spacing requirements from metering equipment shall be as determined by the General Manager.

8. LABELLING

Where premises are sub-divided into multiple occupancies and a separate supply is given to occupiers of individual rooms, suites of rooms, flats, units, etc. an identification number or letter or combination of both must be assigned and marked on the main entrance door of each occupancy. A durable corresponding marking must be placed on the distribution board to identify the supply to that portion of the premises.

Where the occupancy consists of a number of separate areas, each must be marked or some other approved system of identification must be adopted. A corresponding temporary marking shall also be made on the shielding plate of the socket bases for the metering and control equipment for each occupancy.

Where premises are supplied from more than one service, labels shall be provided at each service position and at the main switchboard associated with it indicating the portion of the installation supplied. The location and conditions of operation of any alternative source of supply must also be indicated.

9. DRAWINGS

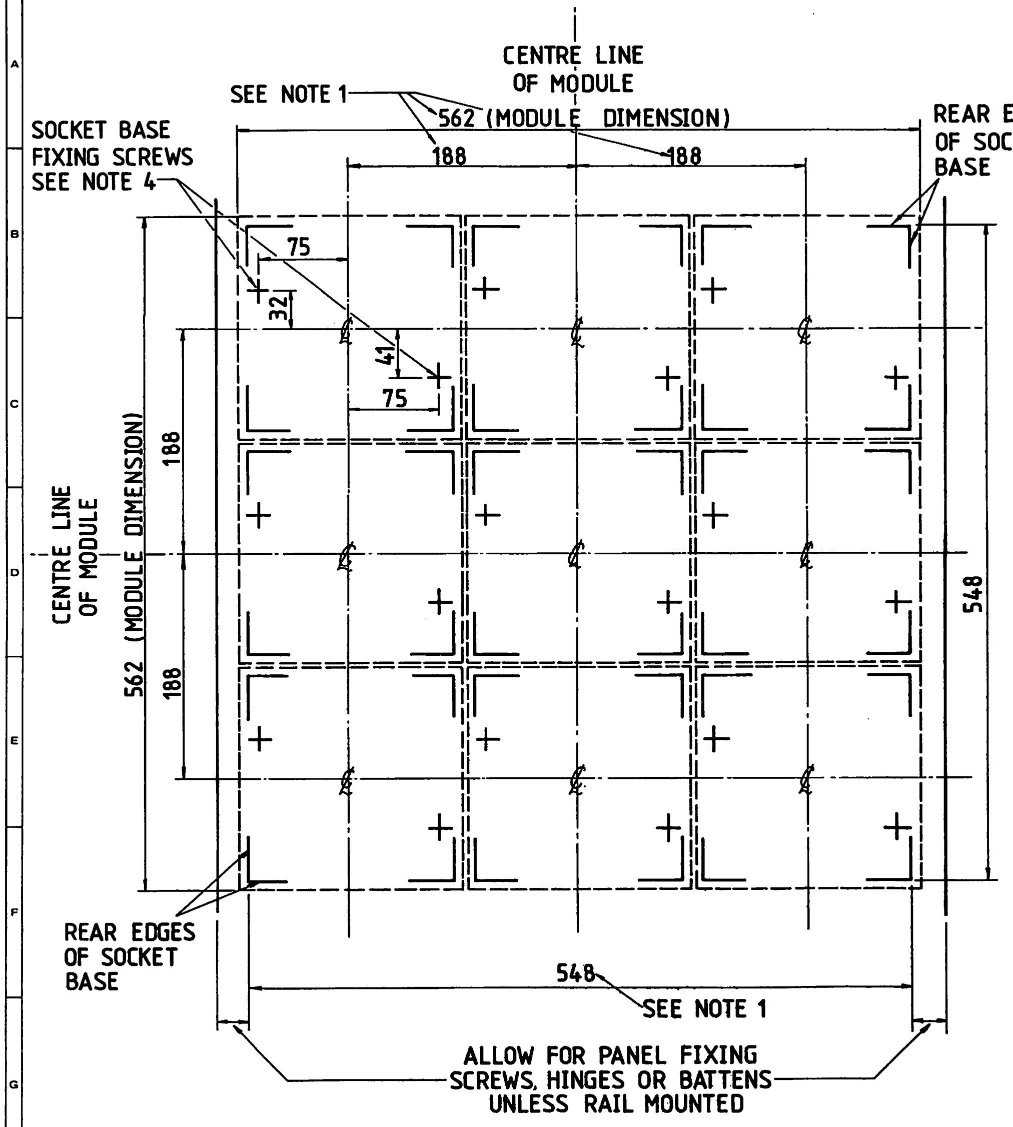
The following drawings as amended and attached form part of this publication.

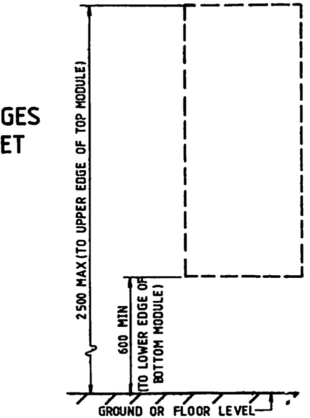
Reference No.

E.I. 101 - "MULTIPLE INSTALLATION METERING - REQUIREMENTS FOR MOUNTING SOCKET BASES".
E.I. 102 - "MULTIPLE INSTALLATION METERING - ARRANGEMENT AND WIRING OF SOCKET BASES".
E.I. 105 - "MULTIPLE INSTALLATION METERING - METER PANEL MOUNTING OF 100A SERVICE FUSES AND NEUTRAL LINK".
E.I. 110 - "SERVICE FUSE CABINET 200-400A CONSUMERS MAINS TERMINATIONS".
E.I. 115 - "SEPARATE PANEL MOUNTING OF 100A SERVICE FUSES AND NEUTRAL LINK".

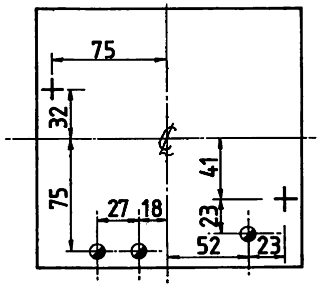
10. ISSUE DATE

This publication dated September, 1981, supersedes that of the same number issued in December, 1978.


CENTRE LINE OF MODULE
SEE NOTE 1
562 (MODULE DIMENSION)
188
188
SOCKET BASE FIXING SCREWS SEE NOTE 4
REAR EDGES OF SOCKET BASE
75
32
41
75
CENTRE LINE OF MODULE
562 (MODULE DIMENSION)
188
188
548
REAR EDGES OF SOCKET BASE
548
SEE NOTE 1
ALLOW FOR PANEL FIXING SCREWS, HINGES OR BATTENS UNLESS RAIL MOUNTED


2500 MAX (TO UPPER EDGE OF TOP MODULE)
600 MIN (TO LOWER EDGE OF BOTTOM MODULE)
GROUND OR FLOOR LEVEL

HEIGHT LIMITATIONS FOR METERS


75
32
75
27
18
41
23
52
23

DRILLING DETAILS FOR PANEL MOUNTED SOCKET BASES

● CABLE ENTRY HOLES
14mm DIAMETER

+ EQUIPMENT FIXING HOLES
3mm DIAMETER FOR TIMBER
5mm DIAMETER FOR INSULATING MATERIAL
3.5mm DIAMETER HOLES FOR RAIL MOUNTING

REFERENCE DRAWINGS

MULTIPLE INSTALLATION METERING—ARRANGEMENT AND WIRING OF SOCKET BASES (E.I. 102)	A1-55703
MULTIPLE INSTALLATION METERING—METER PANEL MOUNTING OF 100A SERVICE FUSES AND NEUTRAL LINK (E.I. 105)	A2-55728
SEPARATE PANEL MOUNTING OF 100A SERVICE FUSES AND NEUTRAL LINK (E I 115)	A2-60054

NOTES.

1. MODULAR ARRANGEMENT, GROUPS OF SOCKET BASES SHALL BE INSTALLED IN ACCORDANCE WITH THIS DRAWING WHICH FORMS PART OF PUBLICATION E.I.8: THEY MAY BE EITHER SEPARATELY-WIRED UNITS OR APPROVED BUSBAR—INTERCONNECTED COMBINATIONS.

   A GROUP OF NINE SOCKET BASES ARRANGED AS SHOWN IS REFERRED TO AS ONE MODULE. WHEN COMBINING MODULES, 16mm (MINIMUM) SPACING IS REQUIRED BETWEEN THE REAR EDGES OF SOCKET BASES, EXCEPT WHERE WIRING ENTERS THROUGH THE SIDE OF THE SOCKET BASES AS IN THE CASE OF ARRANGEMENT 2(iii) WHERE THE MINIMUM SPACING BETWEEN VERTICAL CENTRE-LINES MUST BE INCREASED FROM 188mm TO 225mm.

   HEIGHT LIMITATIONS FOR THE SOCKET BASES IN MULTIPLE—INSTALLATION PREMISES ARE SHOWN AT GRID REF. C8.

2. MOUNTING ACCEPTABLE FACILITES FOR MOUNTING SOCKET BASES ARE AS FOLLOWS:
   i) ON A NON-METALLIC. HINGED. REMOVABLE OR FIXED SWITCHBOARD PANEL USING CONSTRUCTION COMPLYING WITH CLAUSE 2:21 OF THE S.A.A. WIRING RULES. HINGED PANELS SHALL BE HINGED ON A VERTICAL SIDE. A CLEARANCE OF 200mm IS REQUIRED FROM THE FRONT FACE OF THE PANEL TO ANY FIXED OBJECT WITH THE PANEL OPEN 90°
   ii) ON 12mm THICK WATERPROOF - BONDED PLYWOOD SO MOUNTED AS TO PROVIDE AT LEAST 40mm CLEARANCE BEHIND THE PANEL.
   iii) DIRECTLY ATTACHED TO RAILS CONSISTING OF PAIRS OF CHANNEL SECTION 25mm (MAX) WIDE × 12mm DEEP × 1.5mm THICK. ZINC COATED STEEL CHANNELS OR THE EQUIVALENT FIXED VERTICALLY TO A WALL OR OTHER SUITABLE STRUCTURE.

3. SERVICE FUSES AND NEUTRAL LINK. WHERE SOCKET BASES ARE PANEL MOUNTED AS IN 2 (i) AND 2 (ii): THE SERVICE FUSES, SERVICE NEUTRAL LINK AND METERING NEUTRAL LINK WILL GENERALLY BE LOCATED ON THE METER PANEL IN ACCORDANCE WITH NOTE 2 OF DRAWING REFERENCE N° E.I. 105.

4. FIXINGS FOR SOCKET BASES. EACH SOCKET BASE SHALL BE ATTACHED TO THE MOUNTING FACILITY AS FOLLOWS;

INSULATING PANEL	2-M4x35mm MACHINE SCREWS AND NUTS
WOODEN PANEL	2-N°8x30mm WOOD SCREWS
RAIL MOUNTING	2-N°8x32mm THREAD-FORMING SCREWS IN 3.5mm DIAMETER HOLES.

   SEE PANEL DRILLING DETAILS GRID. REF. E8.

5. FIXINGS FOR MOUNTING FACILITIES. FIXINGS ARE REQUIRED TO BE STEEL SCREWS OR BOLTS OF AT LEAST 5mm NOMINAL DIAMETER. IF WALL PLUGS ARE USED, THEY MUST BE OF A DURABLE (PREFERABLY METALLIC EXPANSION) TYPE. WOOD OR VEGETABLE FIBRE WALL PLUGS ARE NOT ACCEPTABLE.
   i) EACH RAIL SHALL HAVE AT LEAST TWO FIXINGS AT NOT MORE THAN 1.0m CENTRES.
   ii) ANY SURROUND USED TO SUPPORT AN INSULATING PANEL SHALL HAVE AT LEAST 4 WELL-SPACED AND SECURE FIXINGS.

6. WIRING, THE WIRING OF GROUPS OF SOCKET BASES SHALL BE IN ACCORDANCE WITH DRAWING REFERENCE NO E.I. 102.

7. FURTHER INFORMATION, SEE PUBLICATION E.I.8 "PROVISIONS FOR SERVICE EQUIPMENT IN MULTIPLE INSTALLATIONS."

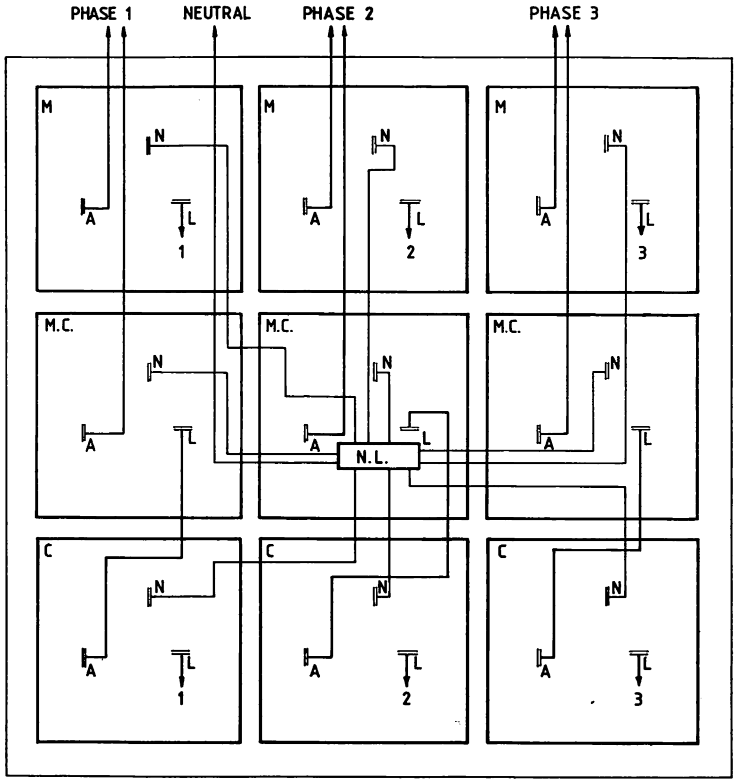
AMENDMENT
1. ISSUED WITH SEPTEMBER 1981 REVISION OF E.I.8

SYDNEY
COUNTY
COUNCIL

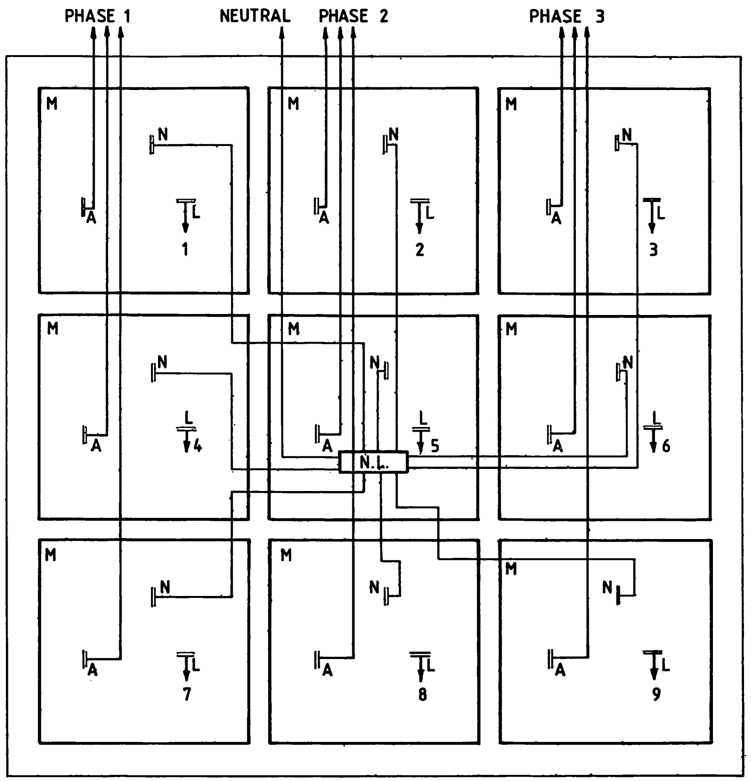
UNLESS OTHERWISE STATED ALL DIMENSIONS ARE IN MILLIMETRES

MULTIPLE INSTALLATION METERING
REQUIREMENTS FOR
MOUNTING SOCKET BASES

REFERENCE NUMBER	
	AMD
EI 101	1



CUSTOMERS SUPPLIED AT PRINCIPAL TARIFF PLUS OFF—PEAK TARIFF



CUSTOMERS SUPPLIED AT A SINGLE TARIFF

LEGEND

A	LINE TERMINAL OF SOCKET. SUPPLIED VIA AN H.R.C. FUSE OR CIRCUIT BREAKER.
C	SOCKET FOR CONTROL DEVICE
L	LOAD TERMINAL SUPPLYING CUSTOMER'S MAIN CONTROL
M	SOCKET FOR PRINCIPAL OR SPECIAL TARIFF METER
MC	SOCKET FOR OFF-PEAK TARIFF METER
N	NEUTRAL TERMINAL OF SOCKET
NL	METERING NEUTRAL LINK (SEE NOTE 3)

NUMERALS INDICATE OCCUPANCY NUMBERS.

REFERENCE DRAWINGS

MULTIPLE INSTALLATION METERING-REQUIREMENTS FOR MOUNTING SOCKET BASES (E.I. 101)	A1-55702
MULTIPLE INSTALLATION METERING—METER PANEL MOUNTING OF 100A SERVICE FUSES AND NEUTRAL LINK (E.I. 105)	A2-55728
SEPARATE PANEL MOUNTING OF 100A SERVICE FUSES AND NEUTRAL LINK (E.I. 115)	A2-60054

NOTES

1. GENERAL THE WIRING OF GROUPS OF SOCKET BASES SHALL BE IN ACCORDANCE WITH THIS DRAWING, THE S.A.A. WIRING RULES AND THE RELEVANT CLAUSES OF PUBLICATION E.I.8. THE DIAGRAMS ARE SCHEMATIC AND APPLY REGARDLESS OF WHETHER THE SOCKET BASES ARE INDIVIDUALLY CABLED OR INTERCONNECTED BY MEANS OF BUSBAR. THE TWO ARRANGEMENTS DRAWN ARE ONLY TYPICAL AND VARIOUS COMBINATIONS OF THEM ARE GENERALLY NECESSARY.

   CONDUCTORS SHALL BE OF ADEQUATE CURRENT CARRYING CAPACITY AND NOT LESS THAN 4mm^2 OR GREATER THAN 25mm.^{2} IF SERVICE FUSES ARE MOUNTED ON THE PANEL CABLES CONNECTED TO THEM SHALL NOT EXCEED 16mm.^{2}

   CABLES CONNECTED TO PANEL-MOUNTED SOCKET BASES SHALL ENTER THE BASES THROUGH THE REAR KNOCKOUTS ONLY. CABLES CONNECTING RAIL-MOUNTED SOCKET BASES MAY ENTER THE REAR OR SIDE KNOCKOUTS AS CONVENIENT.

2. ARRANGEMENT OF SOCKET BASES. THE BASES MUST BE WIRED IN SUCH A WAY THAT
   - i) WHERE THERE IS A THREE PHASE SUPPLY AT THE METERING POSITION, METERS ON THE SAME PHASE ARE VERTICALLY IN LINE, UNLESS OTHERWISE APPROVED.
   - ii) THEY ARE ARRANGED IN THE SAME ORDER AS THE UNIT OCCUPANCY NUMBERS. STARTING FROM THE TOP ROW IN THE APPROPRIATE PHASE POSITION TO ACHIEVE LOAD BALANCE AND NUMBERING FROM LEFT TO RIGHT, FOLLOWED BY THE NEXT LOWER ROW AND SO FORTH TO THE BOTTOM OF THE COLUMN OF PANELS. THE SEQUENCE SHOULD CONTINUE. COMMENCING AT THE TOP ROW OF ANY FURTHER COLUMNS.
   - iii) WHERE CONTROL EQUIPMENT IS NECESSARY DUE TO CHOICE OF AN OFF—PEAK TARIFF FOR A PARTICULAR OCCUPANCY, THE SOCKET BASE FOR CONTROL EQUIPMENT IS REQUIRED TO BE IMMEDIATELY BELOW THAT FOR THE CONTROLLED—LOAD METER. UNLESS OTHERWISE APPROVED.
3. METERING LINK. REQUIREMENTS WITH REGARD TO INSTALLATION OF METERING NEUTRAL LINKS ARE SET OUT IN CLAUSE 5.5.2 OF PUBLICATION E.I.8.
4. FURTHER INFORMATION SEE PUBLICATION E.I.8 "PROVISIONS FOR SERVICE EQUIPMENT IN MULTIPLE INSTALLATIONS."

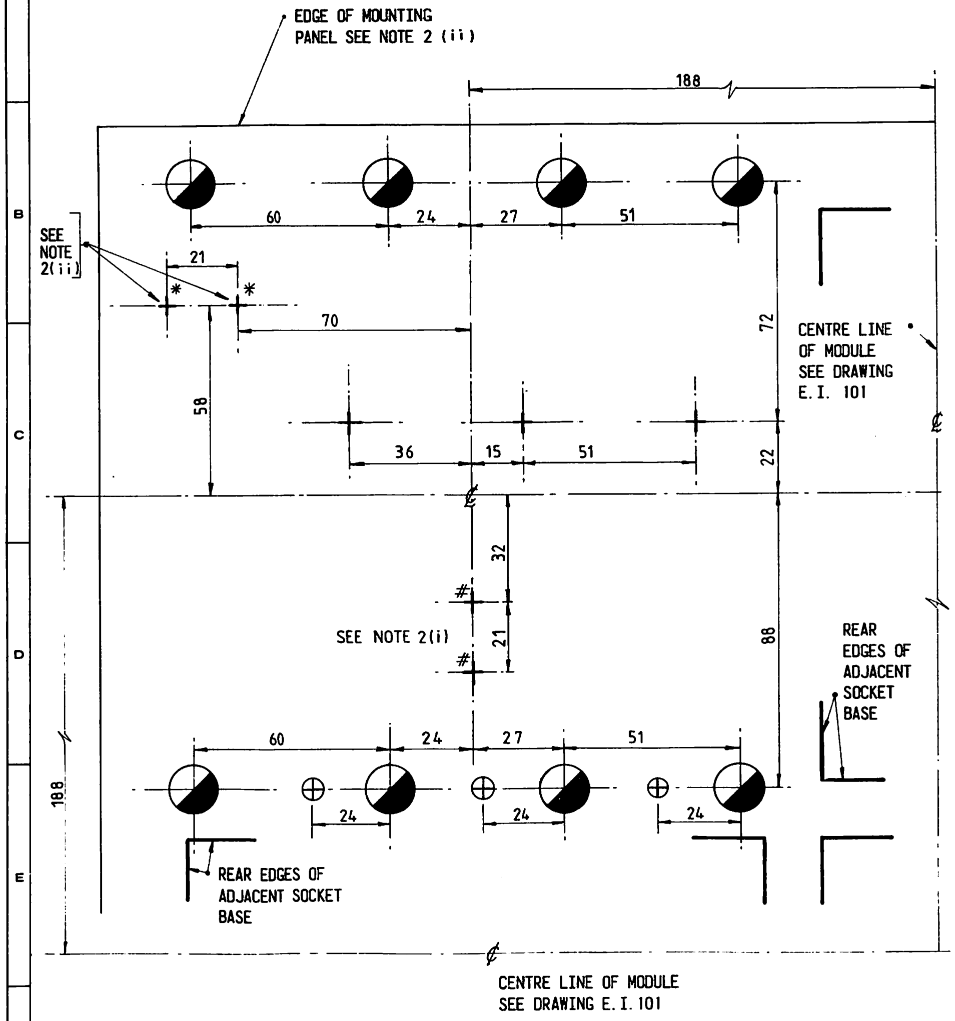
AMENDMENT
1 ISSUED WITH SEPTEMBER 1981 REVISION OF E.I.8

SYDNEY
COUNTY
COUNCIL

UNLESS OTHERWISE STATED ALL DIMENSIONS ARE IN MILLIMETRES.

MULTIPLE INSTALLATION METERING ARRANGEMENT AND WIRING OF SOCKET BASES

REFERENCE NUMBER	
	AMD
EI 102	1


EDGE OF MOUNTING PANEL SEE NOTE 2 (ii)
188
60
24
27
51
SEE NOTE 2(ii)
21
*
*
70
72
CENTRE LINE OF MODULE SEE DRAWING E.I. 101
58
36
15
51
22
℄
32
#
SEE NOTE 2(i)
21
#
88
REAR EDGES OF ADJACENT SOCKET BASE
60
24
27
51
188
24
24
24
REAR EDGES OF ADJACENT SOCKET BASE
℄
CENTRE LINE OF MODULE SEE DRAWING E.I. 101

REFERENCE DRAWINGS

MULTIPLE INSTALLATION METERING - REQUIREMENTS FOR MOUNTING SOCKET BASES (E.I. 101)	A1-55702
MULTIPLE INSTALLATION METERING - ARRANGEMENT AND WIRING OF SOCKET BASES (E.I. 102)	A1-55703
SEPARATE PANEL MOUNTING OF 100A SERVICE FUSES AND NEUTRAL LINK. (E.I. 115)	A2-60054

DRILLING DETAILS

◐ 14mm DIAMETER

+ EQUIPMENT FIXING HOLES — 3mm DIAMETER FOR TIMBER / 5mm DIAMETER FOR INSULATING MATERIAL

⊕ HOLE FOR ADDITIONAL CABLE PER SERVICE FUSE IF REQUIRED.

NOTES.

1. APPLICATION. THIS DRAWING FORMS PART OF PUBLICATION No. E.I.8 AND SHOULD BE READ IN CONJUNCTION WITH DRAWING REFERENCE No. E.I. 101 WHERE SERVICE FUSES ARE TO BE MOUNTED ON A METER PANEL EQUIPPED WITH SOCKET BASES AND THE CONNECTING CABLES ARE NOT IN EXCESS OF 16mm^2. FOR LARGER CABLES UP TO 35mm^2, SEPARATE MOUNTING FACILITIES ARE REQUIRED IN ACCORDANCE WITH DRAWING REFERENCE No E.I. 115.

2. PROVISION FOR SERVICE FUSES AND NEUTRAL LINKS. THE COUNCIL SECURES THE SERVICE FUSES AND SERVICE NEUTRAL LINK BY SCREWS USING HOLES PROVIDED BY THE CONTRACTOR IN POSITIONS INDICATED ON THIS DRAWING. THE SERVICE FUSES ARE GENERALLY INSTALLED IN THE SPACE OTHERWISE OCCUPIED BY THE TOP-LEFT-HAND SOCKET BASE. THE SERVICE NEUTRAL LINK AND METERING NEUTRAL LINK MAY BE LOCATED ON THE FRONT OR BACK OF THE PANEL, DEPENDING ON THE PANEL CONSTRUCTION, AS FOLLOWS:-

   i) HINGED PANELS. THE SERVICE NEUTRAL LINK IS SECURED TO THE BACK OF THE PANEL USING THE HOLES IN THE POSITION MARKED #. THE FOUR HOLES INDICATED AT THE LEFT OF THE PANEL ARE NOT REQUIRED. THE METERING NEUTRAL LINK SHOULD BE INSTALLED BY THE CONTRACTOR IN A SUITABLE POSITION ON THE BACK OF THE PANEL.

   ii) PANELS NOT HINGED. THE SERVICE NEUTRAL LINK IS SECURED TO THE FRONT OF THE PANEL USING THE HOLES IN THE POSITION MARKED *. THE METERING NEUTRAL LINK MUST BE INSTALLED BY THE CONTRACTOR IN A SUITABLE POSITION ON THE FRONT OF THE PANEL OR CLOSE TO IT AND ACCESSIBLE FROM THE FRONT OF THE PANEL.

   ADEQUATE SPACE FOR HAND ACCESS MUST BE PROVIDED TO THE SPACE BEHIND THE PANEL IN THE VICINITY OF THE SERVICE FUSES AND SERVICE NEUTRAL LINK. A MINIMUM ACCESS CLEARANCE OF 100mm IN WIDTH ALONG THE TOP OF THE PANEL IS REQUIRED FOR THIS PURPOSE.

   ANY COVERS OR PANELS OVER ACCESS AREAS SHALL BE EASILY DETACHABLE BY REMOVING SLOTTED-HEAD SCREWS OR BY A METHOD NOT REQUIRING THE USE OF TOOLS.

3. TERMINATION OF CONSUMERS MAINS CABLES. THE FREE LENGTH OF EACH CONSUMERS MAINS CABLE TO BE INSTALLED BY THE CONTRACTOR, MEASURED FROM WHERE IT PASSES THROUGH THE HOLE IN THE PANEL SHALL BE AS FOLLOWS:-

   LINE SIDE OF SERVICE FUSE OR LINK - 75mm (min.)
   LOAD SIDE OF SERVICE FUSE OR LINK - 150mm WITH THE END BARED FOR A DISTANCE OF 20mm FROM THE END.

4. FURTHER INFORMATION. SEE PUBLICATION E.I.8. " PROVISIONS FOR SERVICE EQUIPMENT IN MULTIPLE INSTALLATIONS. "

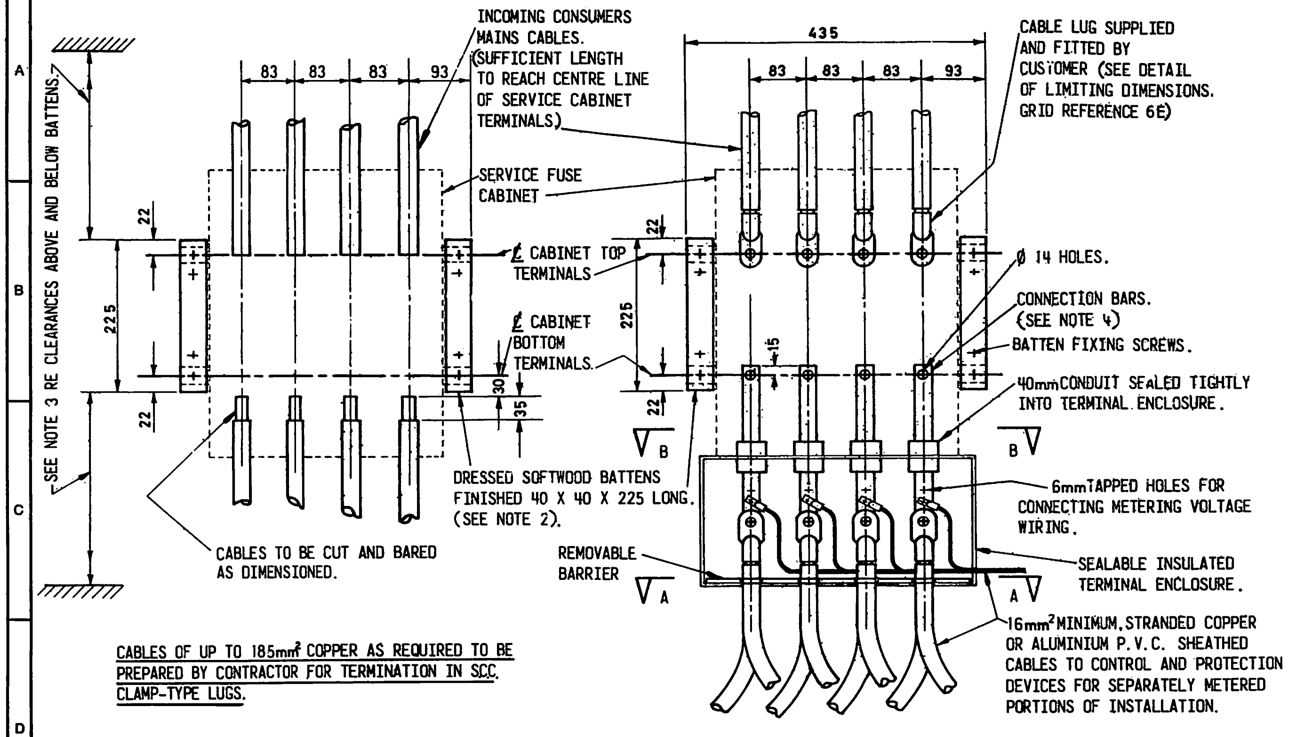
AMENDMENT
1. ISSUED WITH SEPTEMBER 1981 REVISION OF E.I.8

SYDNEY
COUNTY
COUNCIL

UNLESS OTHERWISE STATED ALL DIMENSIONS ARE IN MILLIMETRES

MULTIPLE INSTALLATION METERING
METER PANEL MOUNTING OF
100A SERVICE FUSES AND NEUTRAL LINK

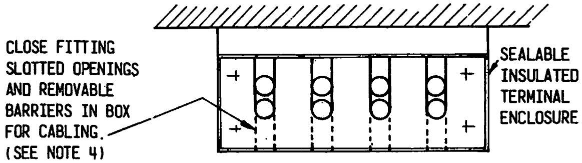
REFERENCE NUMBER	AMD
EI 105	1



SEE NOTE 3 RE CLEARANCES ABOVE AND BELOW BATTENS.
83
83
83
93
22
225
22
INCOMING CONSUMERS MAINS CABLES. (SUFFICIENT LENGTH TO REACH CENTRE LINE OF SERVICE CABINET TERMINALS)
SERVICE FUSE CABINET
℄ CABINET TOP TERMINALS
℄ CABINET BOTTOM TERMINALS
30
35
DRESSED SOFTWOOD BATTENS FINISHED 40 X 40 X 225 LONG. (SEE NOTE 2).
CABLES TO BE CUT AND BARED AS DIMENSIONED.
435
83
83
83
93
22
225
22
15
B
B
A
A
CABLE LUG SUPPLIED AND FITTED BY CUSTOMER (SEE DETAIL OF LIMITING DIMENSIONS. GRID REFERENCE 6E)
Ø 14 HOLES.
CONNECTION BARS. (SEE NOTE 4)
BATTEN FIXING SCREWS.
40mm CONDUIT SEALED TIGHTLY INTO TERMINAL ENCLOSURE.
6mm TAPPED HOLES FOR CONNECTING METERING VOLTAGE WIRING.
REMOVABLE BARRIER
SEALABLE INSULATED TERMINAL ENCLOSURE.
16mm² MINIMUM, STRANDED COPPER OR ALUMINIUM P.V.C. SHEATHED CABLES TO CONTROL AND PROTECTION DEVICES FOR SEPARATELY METERED PORTIONS OF INSTALLATION.

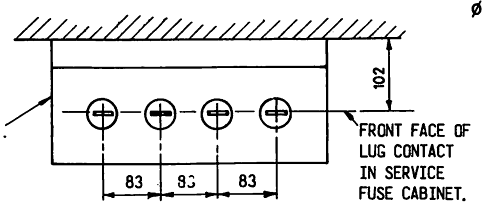
CABLES OF UP TO 185mm² COPPER AS REQUIRED TO BE PREPARED BY CONTRACTOR FOR TERMINATION IN S.C.C. CLAMP-TYPE LUGS.

FACILITIES FOR TERMINATING CABLES WHICH ARE NOT SUITABLE FOR TERMINATION USING THE S.C.C. CLAMP-TYPE LUG.



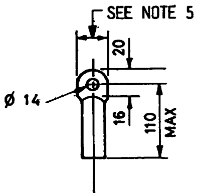
CLOSE FITTING SLOTTED OPENINGS AND REMOVABLE BARRIERS IN BOX FOR CABLING. (SEE NOTE 4)
SEALABLE INSULATED TERMINAL ENCLOSURE.

SECTION AA



102
83
83
83
FRONT FACE OF LUG CONTACT IN SERVICE FUSE CABINET.

SECTION BB



SEE NOTE 5
20
Ø 14
16
110 MAX

LIMITING DIMENSIONS OF CUSTOMER'S LUG IN SERVICE FUSE CABINET.

REFERENCE DRAWING.

STANDARD C.T. UNIT (E.I. 112) A2-58053

NOTES.

1. GENERAL. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH E.I. 8, "PROVISIONS FOR SERVICE EQUIPMENT IN MULTIPLE INSTALLATIONS" AND, WHERE CURRENT TRANSFORMERS ARE TO BE INSTALLED ADJACENT TO THE SERVICE CABINET, PUBLICATION E.I. 18, "METERING WHICH REQUIRES THE USE OF CURRENT TRANSFORMERS" AND DRAWING REFERENCE NO. E.I. 112, "STANDARD C.T. UNIT."

2. MOUNTING OF SERVICE FUSE CABINET. THE CUSTOMER IS REQUIRED TO ERECT BATTENS IN A POSITION AS NOMINATED BY THE COUNCIL'S OFFICER. (SEE CLAUSE 4.2.2, PUBLICATION E.I. 18 WHERE THE STANDARD C.T. UNIT IS ALSO REQUIRED).

3. CLEARANCES FOR CONSUMERS MAINS. THE MINIMUM CLEARANCES REQUIRED FOR INCOMING CONSUMERS MAINS CABLES ENTERING THE SERVICE FUSE CABINET AT THE TOP OR BOTTOM AND MEASURED FROM THE END OF BATTENS TO ANY FIXED OBJECT AS ILLUSTRATED IN THIS DRAWING SHALL BE AS FOLLOWS:—

SIZE AND TYPE OF CABLE.	CLEARANCE. (mm)
LESS THAN 185mm²	550
185mm² TO 300mm² SINGLE CORE	700
185mm² TO 300mm² MULTI-CORE	1000

4. CONSUMERS MAINS TERMINATIONS. WHERE CABLES ARE NOT SUITABLE FOR TERMINATION IN THE CABINET USING THE S.C.C. CLAMP-TYPE LUG, THE CUSTOMER SHALL PROVIDE AN APPROVED CONNECTING FACILITY FITTED READY FOR CONNECTION TO THE SERVICE CABINET TERMINALS. (SEE CLAUSE 4.4.3 PUBLICATION E.I. 8 AND CLAUSES 4.2.3 AND 4.2.4 OF PUBLICATION E.I. 18). THE DRAWING SHOWS REQUIREMENTS FOR LUGS AND CONNECTING BARS.

5. LUGS SUPPLIED BY CUSTOMER. THE CONTACT SURFACE OF THE LUG SHALL BE A MAXIMUM OF 40mm. IN WIDTH AND BE FINISHED TO A MEDIUM COMMERCIAL MACHINED FINISH.

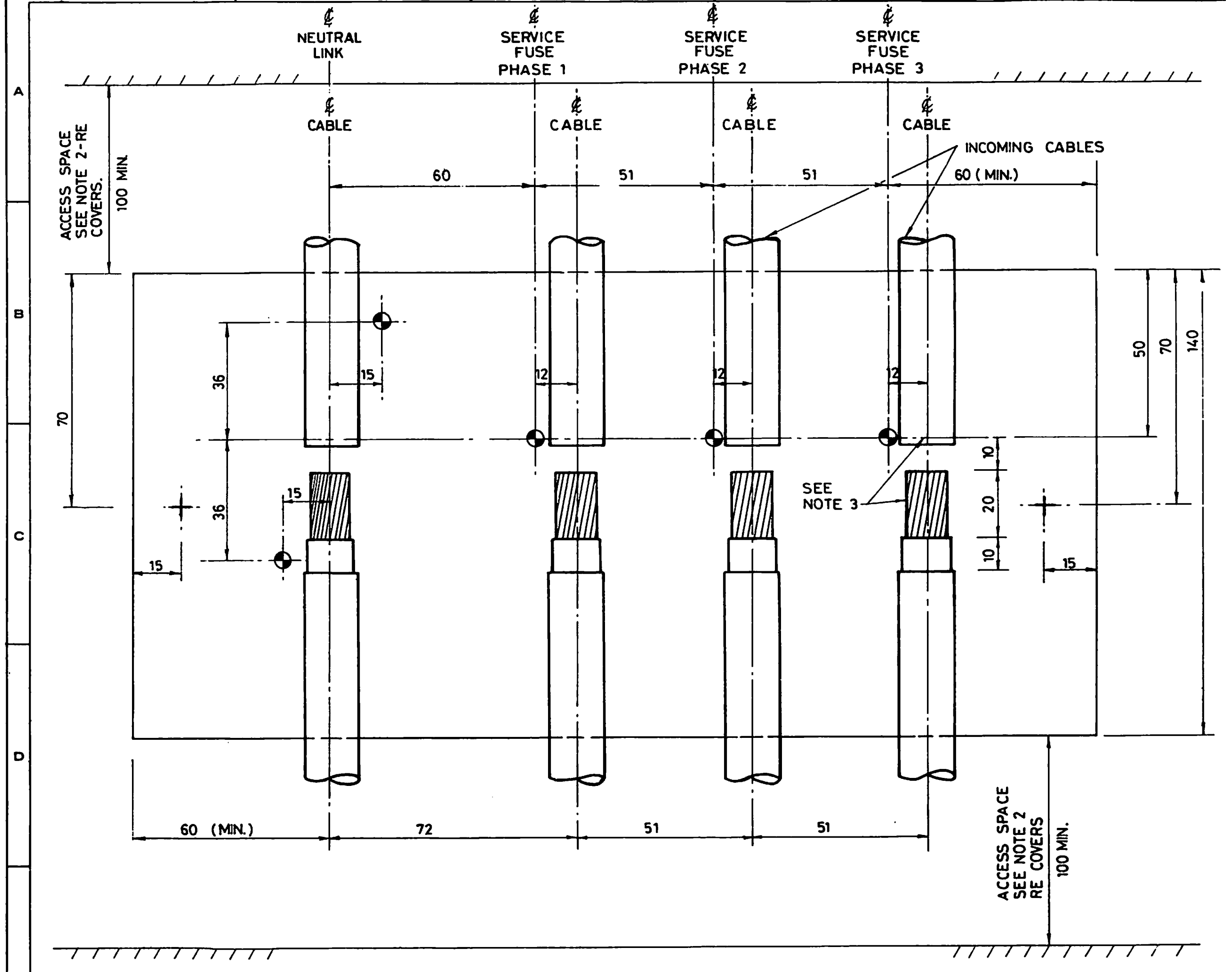
AMENDMENT

SYDNEY
COUNTY
COUNCIL

UNLESS OTHERWISE STATED ALL DIMENSION ARE IN MILLIMETRES

SERVICE FUSE CABINET 200-400A
CONSUMERS MAINS
TERMINATIONS

REFERENCE NUMBER	
	AMD
EI 110	


℄ NEUTRAL LINK
℄ SERVICE FUSE PHASE 1
℄ SERVICE FUSE PHASE 2
℄ SERVICE FUSE PHASE 3
℄ CABLE
℄ CABLE
℄ CABLE
℄ CABLE
INCOMING CABLES
60
51
51
60 (MIN.)
ACCESS SPACE SEE NOTE 2-RE COVERS.
100 MIN.
70
36
36
15
15
15
12
12
12
50
70
140
10
20
10
15
SEE NOTE 3
60 (MIN.)
72
51
51
ACCESS SPACE SEE NOTE 2 RE COVERS
100 MIN.

REFERENCE DRAWINGS.

MULTIPLE INSTALLATION METERING— REQUIREMENTS FOR MOUNTING SOCKET BASES (E.I. 101)	A1-55702
MULTIPLE INSTALLATION METERING— METER PANEL MOUNTING OF 100A SERVICE FUSES AND NEUTRAL LINK (E.I. 105)	A2-55728

NOTES:

1. PROVISION FOR SERVICE FUSES AND NEUTRAL LINK. THIS DRAWING SHOWS REQUIREMENTS WHICH APPLY WHERE A CUSTOMER CHOOSES TO PROVIDE A SEPARATE SURFACE—WIRED PANEL FOR THE PURPOSE OF MOUNTING THE COUNCIL'S 100A SERVICE FUSES AND NEUTRAL LINK. THE PANEL SHALL BE NON-METALLIC. REMOVABLE AND HAVE ITS OWN MOUNTING FACILITIES. THE CONSTRUCTION SHALL COMPLY WITH CLAUSE 2:21 OF THE S.A.A. WIRING RULES AND THE PANEL SHALL NOT BE USED FOR THE MOUNTING OF ANY OTHER EQUIPMENT.
2. CLEARANCE. ADEQUATE CLEAR ACCESS IS REQUIRED TO THE FRONT OF THE PANEL AND TO THE SPACE BEHIND THE PANEL AS INDICATED ON THIS DRAWING. COVERS FOR ACCESS TO THE REAR OF THE PANEL SHALL BE NON-METALLIC AND READILY REMOVABLE WITHOUT THE NEED FOR DISCONNECTION OF CABLES FROM THE SERVICE FUSES OR NEUTRAL LINK.
   SUCH COVERS SHALL BE EASILY DETACHABLE BY REMOVING SLOTTED-HEAD SCREWS OR A METHOD NOT REQUIRING THE USE OF TOOLS.
3. TERMINATION OF CABLES. THE CONTRACTOR IS REQUIRED TO BARE FOR A DISTANCE OF 20mm THE ENDS OF THE CABLE FOR CONNECTION TO THE LOAD SIDE OF THE SERVICE FUSES AND NEUTRAL LINK. ADEQUATE LENGTH OF CABLE MUST BE PROVIDED TO PERMIT EASY PREPARATION AND MANIPULATION OF THE CABLES WHEN BEING CONNECTED.
4. FURTHER INFORMATION. SEE PUBLICATION E.I.8. "PROVISIONS FOR SERVICE EQUIPMENT IN MULTIPLE INSTALLATIONS."

DRILLING DETAILS:

⊕	5mm DIAMETER EQUIPMENT FIXING HOLES
+	℄ PANEL FIXING SCREWS M5 SLOTTED HEAD SCREWS OR EQUIVALENT THREAD FORMING SCREWS.

AMENDMENT

SYDNEY
COUNTY
COUNCIL

UNLESS OTHERWISE STATED ALL DIMENSION ARE IN MILLIMETRES

SEPARATE PANEL MOUNTING OF
100A SERVICE FUSES AND NEUTRAL LINK

REFERENCE NUMBER

EI 115

AMD

THE
SYDNEY
COUNTY
COUNCIL

No. E.I. 10

JULY, 1986

Domestic Tariff

1. SCOPE.

2. CONDITIONS OF THE TARIFF.

3. PREMISES ELIGIBLE FOR DOMESTIC TARIFF.

4. MULTIPLE OCCUPANCY.

5. MINOR LOADS OTHER THAN DOMESTIC.

6. PREMISES USED FOR MORE THAN ONE PURPOSE.

7. ISSUE.

THE
SYDNEY
COUNTY
COUNCIL

No. E.I. 10

JULY, 1986

Domestic Tariff

1. SCOPE

This publication reproduces and supplements the section of the Electricity Price List dealing with the Domestic Tariff.

2. CONDITIONS OF THE TARIFF

The conditions of the tariff as set out in the Electricity Price List are reproduced as follows:-

PRINCIPAL TARIFFS – CONDITIONS

DOMESTIC TARIFF

Applicable to electricity supplied to the following:–

(i) Private dwellings.
(ii) Boarding houses and lodging houses as defined in the Public Health Act, 1902.
(iii) Retirement villages.
(iv) Residential sections of nursing homes and hospitals.
(v) Living quarters for members and staff of religious orders.
(vi) Residential sections of educational institutions.
(vii) Children's homes.
(viii) Approved baby health centres, day nurseries and kindergartens.
(ix) Churches – buildings or premises which are used principally for public worship or for public worship and educational purposes.
(x) Approved caravan sites.

1. Minimum Chargeable Energy

The minimum energy chargeable in respect of each dwelling in respect of each quarterly period or part thereof shall be:–

(a) The energy consumed during the quarterly period or part thereof as determined from the reading of an energy meter or meters or otherwise as determined in accordance with Clause 9 of the General Conditions of Supply; or
(b) 100 kilowatt-hours, whichever is the greater.

2. Multiple Occupancy – Domestic

In respect of multiple dwellings the Domestic Tariff will be applied separately to each dwelling unit to which a separately metered supply of electricity is given. If the supply to each dwelling unit is not separately metered and charged for by the Council, supply to such dwelling units shall be provided at the Domestic Tariff subject to:–

(a) The number of kilowatt-hours chargeable under the first block being determined by multiplying the figure of 200 by the number of dwelling units as determined by the General Manager.

(b) The minimum chargeable energy defined in Clause 1(b) applying to each separate dwelling unit.

If approved by the General Manager, the electrical installation in premises other than domestic which include self-contained dwelling units, may be arranged for separate metering of such units by the Council. In such cases, the Domestic Tariff will apply to the separately metered dwelling units.

3. Minor Loads other than Domestic

When portion of a premises is used principally for domestic purposes, loads not exceeding five kilowatts, which are used for other than domestic purposes may be supplied at the Domestic Tariff.

For this purpose, the loading of equipment shall be taken to be:–

(i) For permanently connected equipment, the actual rating of the equipment.

(ii) For lighting fittings; 60 watts per lighting fitting.

(iii) For plug sockets – sockets rated 10 amperes or 10 amperes per phase; 500 watts or 500 watts per phase.
– sockets rated at other than 10 amperes; the wattage rating shall be taken as 50 times the current rating of the socket.

Provided that, for any plug socket which is installed solely for the purpose of connecting a specific fixed or semi-portable appliance or lighting fitting, the loading shall be taken as the actual rating of the associated equipment.

3. PREMISES ELIGIBLE FOR DOMESTIC TARIFF

3.1 PRIVATE DWELLINGS

A private dwelling is a house, flat, home unit, town house or similar premises.

For the purpose of the Domestic Tariff, a private dwelling can also include:-

(a) the premises provided for the manager of a hotel, motel, caravan park or the like when these are separately metered, provided that no accommodation for hire is included in that portion of the premises;

(b) any unoccupied dwelling that is exhibited by a builder or development company as a "demonstration" home or unit; or

(c) any separately metered living unit which shares kitchen, bathing or toilet facilities with other such living units.

3.2 BOARDING HOUSES AND LODGING HOUSES

The Public Health Act, 1902, defines boarding houses and lodging houses as follows:-

"Boarding house" means any house (not being licensed premises in respect of which a hotelier's licence under the Liquor Act, 1982, is in force) in which three or more persons exclusive of the family of the proprietor thereof are boarded for hire or reward from week to week or for more than one week.

"Lodging house" means any house (not being licensed premises in respect of which a hotelier's licence under the Liquor Act, 1982, is in force) in which three or more persons exclusive of the family of the proprietor are lodged for hire or reward from week to week or for more than a week.

3.3 RETIREMENT VILLAGES

Retirement villages consist of premises for the accommodation of the aged and may consist of a group of private dwellings or of communal type accommodation, or both. Such premises may include facilities for limited care of the residents. Sections of the establishment providing full nursing or hospital care will not be regarded as part of the retirement village for the purposes of the Domestic Tariff. They must be separately metered if the Domestic Tariff is to be applicable to the residential sections of the premises.

3.4 RESIDENTIAL SECTIONS OF NURSING HOMES AND HOSPITALS

Residential sections of nursing homes and hospitals are those sections providing residential accommodation for staff and patients in premises such as hospitals, nursing homes, homes for the aged, convalescent and rest homes and hostels for the handicapped but does not include those sections providing nursing or hospital care.

3.5 LIVING QUARTERS FOR MEMBERS AND STAFF OF RELIGIOUS ORDERS

The living quarters for members and staff of religious orders are eligible for the Domestic Tariff. A "religious order" shall, for the purposes of the Domestic Tariff, be deemed to include any religious denomination and a "member" shall include persons undergoing training for admission to a religious order. However, premises used by members for other than permanent residence, such as camps used as convention centres, premises used as vacation centres, temporary accommodation and the like, are not eligible.

3.6 RESIDENTIAL SECTIONS OF EDUCATIONAL INSTITUTIONS

Residential sections of educational institutions are those sections providing residential accommodation for students and staff in universities, colleges or schools.

3.7 CHILDRENS' HOMES

Premises such as orphanages, homes for handicapped children and foster parent homes are eligible for the Domestic Tariff.

3.8 APPROVED BABY HEALTH CENTRES, DAY NURSERIES AND KINDERGARTENS

Domestic Tariff is available to premises included under this heading where the establishment is "approved". In general, registration by a government department or instrumentality may be accepted as approval.

These premises may be incorporated in other premises such as a municipal or civic centre, schools or hospitals, but in order to take advantage of the tariff, they must be separately metered.

3.9 CHURCHES

The Domestic Tariff may be applied to a building which is used for public worship or to a building used partly for public worship and partly for educational purposes, and to ancillary premises such as church halls, either incorporated in the church building or separate on the same block of ground, normally used for religious instruction and social or similar functions related to the church activities. The tariff will not apply to buildings which are used as schools. Where school buildings and "church" buildings are metered as one, an alternative tariff will apply to the premises as a whole.

The Domestic Tariff will not apply to any portion of a building which is used for "commercial purposes", such as for frequent letting to other bodies.

3.10 APPROVED CARAVAN SITES

Approved caravan sites are those sections of caravan parks approved by government or local government instrumentalities, for permanent occupancy. For the Domestic Tariff to be applied, it would be necessary for the individual sites to be separately metered or the permanently occupied portion of the park to be metered separately as a whole with multiple occupancy provisions and for the proprietor to show evidence of approval by the appropriate instrumentality.

4. MULTIPLE OCCUPANCY

4.1 Multiple occupancy exists when a number of separate living units, each containing kitchen, bathing and toilet facilities, are metered through one meter or polyphase set of meters.

4.2 Whether or not premises contain separate living units as described in Clause 4.1, any other load, including bedrooms and dormitories and any common facilities such as lifts, swimming pool, ventilation, air conditioning, commercial dining rooms, kitchens, club rooms etc., for the exclusive use of the occupants of the premises and their guests, may be supplied at the Domestic Tariff and if not separately metered, shall be regarded collectively as one additional occupancy for charging purposes.

4.3 Where a nursing or hospital care section supplied at the Institution Tariff shares facilities covered by Clause 4.2 above with a retirement village and provides care principally for residents of the village, such shared facilities may be supplied, together with common facilities for the retirement village, as one additional occupancy at the Domestic Tariff, i.e. the use of retirement village lifts, air conditioning, etc., by hospital inmates, staff or visitors, does not disqualify such load from being supplied at the Domestic Tariff.

4.4 In caravan parks or marinas, each approved caravan site or mooring shall, if not separately metered by the Council, be regarded as an additional occupancy for charging purposes. (See Clause 3.10 "Approved Caravan Sites").

4.5 Common facilities for the exclusive use of the residents of an approved "permanent" section of a caravan park and their guests shall be regarded collectively as an additional occupancy for charging purposes.

5. MINOR LOADS OTHER THAN DOMESTIC

5.1 When premises which are otherwise eligible for Domestic Tariff contain a portion that would not be eligible for the Tariff, the premises as a whole may be eligible for the Tariff, provided that the ineligible load does not exceed the limits stated in Clause 3 of the tariff conditions.

5.2 The following are regarded as domestic activities for the purpose of the Tariff:-

(a) the pursuit of a hobby;

(b) the use of a portion of a private dwelling as a study, or as a place where a professional or business person keeps and deals with papers relating to work carried out elsewhere; or

(c) the carrying out of occasional teaching of the arts (such as music, painting, elocution and the like) or occasional dress-making, millinery, cooking and like activities by the members of the household for remuneration.

6. PREMISES USED FOR MORE THAN ONE PURPOSE

6.1 Where supply is taken through one meter or polyphase set of meters for premises which are partly used for purposes to which the Domestic Tariff is applicable and partly for other purposes, and where the load used for such other purposes is relatively large, the Domestic Tariff is not applicable to the whole of such supply. However, if load which, considered independently, is eligible for the Domestic Tariff and is separately metered, it may be taken at that tariff whilst the remainder of the supply to the establishment is taken at any other tariff or tariffs for which it may be eligible.

7. ISSUE

This is an original issue in the E.I. series of documents.

THE
SYDNEY
COUNTY
COUNCIL

No. E.I. 11

DECEMBER, 1986

Off-Peak Tariffs

1. SCOPE.

2. CONDITIONS OF THE TARIFFS.

3. SUPPLEMENTARY INFORMATION.
    3.1 DEFINITIONS.
    3.2 EXTENSION OF OFF-PEAK SUPPLY TO OTHER APPLIANCES (OPEX).

4. COMBINATIONS OF STORAGE WATER HEATERS.

5. CONTROL OF WATER HEATERS.

6. OTHER HEATING SOURCES.

7. SWIMMING POOLS, SPAS AND TURBO TUBS.

8. TRANSFERS BETWEEN TARIFFS.

9. EXISTING WATER HEATERS.

10. PROHIBITION OF CHANGE-OVER SWITCHING.

11. PROTECTIVE DEVICES OF WATER HEATERS ASSOCIATED WITH SWIMMING POOLS OR SPAS.

12. REQUIREMENTS FOR INSTALLATION OF A CONTACTOR.

13. OFF-PEAK STORAGE WATER HEATER CASH SUBSIDY/LOAN SCHEME (OPEX).
    13.1 ELIGIBILITY.
    13.2 APPLICATIONS.
    13.3 EXISTING STORAGE WATER HEATERS.
    13.4 PAYMENT.
    13.5 APPLICATION FORMS/ENQUIRIES.

14. ISSUE.

THE
SYDNEY
COUNTY
COUNCIL

No. E.I. 11

DECEMBER, 1986

Off-Peak Tariffs

1. SCOPE

This publication reproduces and supplements the section of the Electricity Price List dealing with Off-Peak Tariffs.

2. CONDITIONS OF THE TARIFFS

The conditions of the tariffs as set out in the Electricity Price List are reproduced as follows:-

SPECIAL TARIFFS – CONDITIONS

OFF-PEAK TARIFFS

Applicable to electricity used for operating storage water heaters, thermal storage space heaters and other approved appliances as shown below, provided that they comply with the requirements specified and are controlled by the Council's equipment so that supply is available only during hours determined by the General Manager.

OFF-PEAK TARIFF 1

(i) Storage Water Heaters – the main heating unit or units shall be controlled by the Council's equipment so that supply is available at night during hours determined by the General Manager.

Supply to any boosting unit fitted shall be continuously available and the energy supplied shall be charged at the principal tariff applicable to the premises concerned.

Unless otherwise approved by the General Manager, storage water heaters shall comply with the following requirements:–

(a) The rated hot water delivery shall be not less than 250 litres.

(b) Boosting and main heating units shall be so controlled that both cannot be energised simultaneously.

(c) All heating units shall have a rating of 4.8kW and shall be arranged as follows:–

RATED HOT WATER DELIVERY OF HEATER	NUMBER OF HEATING UNITS	
	MAIN	BOOSTING (OPTIONAL)
From 250 litres up to and including 400 litres	One	One
Above 400 litres but not exceeding 630 litres	Two	One
Above 630 litres	As necessary to provide full amount of heat required in 9 hours	One

(ii) Thermal Storage Space Heaters – The heating unit shall be controlled by the Council's equipment so that supply is available at night during hours determined by the General Manager.

The aggregate rating of thermal storage space heaters shall be not less than 3kW, except where a storage water heater is also installed and supplied at the Off-Peak Tariff 1.

Effective: 1st January, 1986

SPECIAL TARIFFS – CONDITIONS

OFF-PEAK TARIFF 1 (Contd.)

(iii) Swimming Pools – Heating units and associated equipment of swimming pools.

(iv) Other Appliances – Swimming pool pumps, dishwashers, clothes dryers, washing machines and other appliances approved by the General Manager, provided that:–

- (a) The appliances are permanently connected.
- (b) The principal tariff applicable to the premises is the Domestic Tariff.
- (c) A storage water heater is also installed and supplied at the Off-Peak Tariff 1.
- (d) The whole of the Off-Peak installation is controlled by the Council's equipment so that supply is available at night during hours determined by the General Manager.

OFF-PEAK TARIFF 2

(i) Storage Water Heaters – The main heating unit or units shall be controlled by the Council's equipment, so that supply is interrupted over peak periods as considered necessary by the General Manager.

Supply to any boosting unit fitted shall be continuously available and the energy supplied shall be charged at the principal tariff applicable to the premises concerned.

Unless otherwise approved by the General Manager, storage water heaters shall comply with the following requirements:–

- (a) The rated hot water delivery shall be not less than 100 litres.
- (b) Boosting and main heating units shall be so controlled that both cannot be energised simultaneously.
- (c) All heating units shall have a rating of 4.8kW and shall be arranged as follows:–

SPECIAL TARIFFS – CONDITIONS

OFF-PEAK TARIFF 2 (Contd.)

RATED HOT WATER DELIVERY OF HEATER	NUMBER OF HEATING UNITS	
	MAIN	BOOSTING (OPTIONAL)
From 100 litres up to but not including 250 litres	One	One
From 250 litres up to and including 400 litres	One	One
Above 400 litres but not exceeding 630 litres	Two	One
Above 630 litres	As determined by the General Manager	One

(ii) Thermal Storage Space Heaters – The heating unit shall be controlled by the Council's equipment so that supply is interrupted over peak periods as considered necessary by the General Manager.

The aggregate rating of thermal storage space heaters shall be not less that 3kW except where a storage water heater is also installed and supplied at the Off-Peak Tariff 2.

(iii) Swimming Pools – Heating units and associated equipment of swimming pools.

(iv) Other Appliances – Swimming pool pumps, dishwashers, clothes dryers, washing machines, air conditioners and other appliances approved by the General Manager, provided that:–

- (a) The appliances are permanently connected.
- (b) The principal tariff applicable to the premises is the Domestic Tariff.
- (c) A storage water heater is also installed and supplied at the Off-Peak Tariff 2.
- (d) The whole of the Off-Peak installation is controlled by the Council's equipment so that supply is interrupted over peak periods as considered necessary by the General Manager.

3. SUPPLEMENTARY INFORMATION

3.1 DEFINITIONS

3.1.1 Storage Water Heater

"Storage Water Heater" shall mean a device in which water is heated and stored in a container or containers and drawn off for use. The term shall include a water heater incorporating a heat exchanger for transferring heat from the stored water to other water which is drawn off. The water cannot be used within the container.

3.1.2 Thermal Storage Space Heater

"Thermal Storage Space Heater" is a device by means of which energy in the form of heat may be stored in concrete, masonry, metal, liquid or other suitable material for a lengthy period and subsequently liberated to surrounding air. The device may be in the form of an independent unit or it may be incorporated in the building structure, e.g. heating units embedded in a concrete floor. Thermal storage space heaters are eligible for connection at Off-Peak Tariff 1 and Off-Peak Tariff 2.

The minimum rating of 3 kW is no longer applicable to thermal storage space heaters in an installation where a storage water heater is also supplied at the same "Off-Peak" Tariff.

3.1.3 Swimming Pools

For the purpose of the "Off-Peak" Tariffs, spas and turbo tubs shall be regarded as swimming pools.

3.1.4 Boosting Heating Unit

"Boosting Heating Unit" or "boosting unit" shall mean a heating unit, intended for use when supply is not available to the main heating unit. It is located near the top of the container to limit the quantity of water heated at the principal tariff.

3.2 EXTENSION OF OFF-PEAK SUPPLY TO OTHER APPLIANCES (OPEX)

The conditions associated with other appliances are set out in the conditions to the tariff but some of the important features are highlighted below:-

(a) Other appliances are acceptable as follows:-

- (i) Off-Peak 1 - Swimming pool pumps, dishwashers, clothes dryers and washing machines.
- (ii) Off-Peak 2 - Swimming pool pumps, dishwashers, clothes dryers, washing machines and air conditioners.

(b) The off-peak extension to other appliances is only applicable where the principal tariff applicable to the premises is the Domestic Tariff.

(c) An Off-Peak Tariff is not applicable to other appliances unless the supply is also taken at that tariff for a storage water heater.

(d) There is no minimum rating requirement for other appliances.

(e) It should be noted that costs may be involved in separation of wiring and switchboard alterations necessary to comply with the tariff conditions and that the service of an Electrical Contractor would be required in this respect.

(f) The hours of availability of supply may not suit the intended use of the appliance.

  (i) Off-Peak 1 supply is, in general, only available for a 6 hour period between the hours of 10.00 p.m. and 7.00 a.m. each night and the commencement of that period is not nominated and may vary.

  (ii) Off-Peak 2 supply is, in general, only available for 16 hours each day with supply being not available for approximately 8 hours during the period from 4.00 p.m. to 1.00 a.m.

(g) The provision of a suitable sealable contactor will be required where the total off-peak load exceeds 25 amperes or 6 kW, or more than one phase of supply is switched, or motor starting current is involved.

(h) Appliances must be permanently wired. Connection by means of socket outlets is not acceptable.

(i) Customers should ascertain their local Council's requirements before making a firm commitment to the connection at an off-peak tariff of equipment which may produce offensive noise within the scope of the Noise Control Act.

4. COMBINATIONS OF STORAGE WATER HEATERS

Installations supplied at an off-peak tariff may include a combination of storage water heaters subject to the following conditions:-

(a) The combined rated hot water delivery meets the minimum requirements for the particular tariff.

(b) The rated hot water delivery of any heater shall not be less than 100 litres.

(c) The combined total of the heating units is not less than 4.8 kW.

(d) The combined rating of the heating unit complies with the conditions of the tariff.

(e) Where an additional water heater is being installed and conditions (a), (b) and (c) above are fulfilled, the heating hours of the first heating unit should be taken into account in determining the rating of the additional heating unit. The minimum heating unit rating for the additional water heater shall comply with the following table:-

Rated Hot Water Delivery Litres	Minimum Rating in Watts	
	6 Hours Supply To Existing Water Heater	9 Hours Supply To Existing Water Heater
100	1200	1200
125	1800	1200
160	1800	1200
200	2400	1800
250	3600	2400
315	4800	3600

5. CONTROL OF WATER HEATERS

5.1 Where a storage water heater includes a boosting unit which is supplied at an alternative tariff to the main heating unit, it is desirable that both circuits be controlled by the one double pole switch, to eliminate the possibility of an excessive account should the main heating unit be switched "Off" while the boosting unit remains in service.

5.2 Figures 1 and 2, page 11, show typical wiring diagrams for storage water heaters with and without boosting unit, respectively. Where the heater in Figure 1 is supplied by a circuit having a common neutral, then a double pole isolating switch is mandatory to comply with Australian Standard AS3000.

6. OTHER HEATING SOURCES

6.1 Off-peak tariffs are not available to electrically boosted water heaters where gas, kerosene or other types of fuel are used as the primary source of heating. However, electrically boosted solar storage water heaters will be supplied at an Off-Peak Tariff under similar conditions to other types of electric storage water heaters. The rated hot water delivery will include the electrically heated and solar sections of the unit.

6.2 Heat pump storage water heaters will also be supplied at an Off-Peak Tariff provided that the rating of the motor driving the compressor is not less than 500 watts.

7. SWIMMING POOLS, SPAS AND TURBO TUBS

7.1 An electrically heated swimming pool, spa or turbo tub is a storage water heater and is eligible for an Off-Peak Tariff subject to minimum volume limitations.

The nominal capacity of the pool or tub shall be taken as the rated hot water delivery in determining eligibility for supply at an Off-Peak Tariff.

7.2 The compressor and fans associated with heat pump systems used solely to transfer atmospheric heat to the pool or tub may be supplied at an Off-Peak Tariff. Such devices shall be controlled by a customer's contractor so that the Council's time control device does not switch motor starting current.

7.3 It should be noted that the application of Off-Peak Tariff 1 to pool heaters may not be practical where local government authorities prohibit the use of noise producing swimming pool equipment at night.

8. TRANSFERS BETWEEN TARIFFS

Except as provided for in (i), (ii) and (iii) below, transfers between tariffs shall not be made at intervals of less than twelve months. The exceptions are as follows:-

i) When additional controlled load is connected at the same time.

ii) Where the customer is new to premises in which there is controlled load.

iii) Where a transfer from Off-Peak Tariff 1 to Off-Peak Tariff 2 is requested as a result of changed circumstances which render the Off-Peak Tariff 1 hot water system inadequate.

9. EXISTING WATER HEATERS

Subject to the heating units complying with the requirements of the table associated with Clause 4(e), the following is permitted:-

9.1 Existing water heaters formerly supplied at an eliminated tariff may be replaced by heaters of similar or increased capacity.

9.2 Existing water heaters that were eligible for supply at, but not necessarily connected at one of the eliminated controlled load tariffs at the time of installation may be supplied at the presently available and appropriate Off-Peak Tariff.

10. PROHIBITION OF CHANGE-OVER SWITCHING

10.1 The conditions of the Off-Peak Tariffs make it clear that load supplied at an Off-Peak Tariff may be given supply only within prescribed hours. Therefore, any arrangement, such as a change-over switch which would enable load normally supplied at an Off-Peak Tariff to be transferred by the customer to supply at another tariff is not permissible.

10.2 The requirements of Clause 10.1 do not preclude an arrangement whereby a domestic swimming pool heating unit normally supplied at an Off-Peak Tariff is alternatively used to heat a separate spa pool at Domestic Tariff by means of a change-over switch provided that the following conditions are met:-

(a) The capacity of the main pool shall meet the requirements of the Off-Peak Tariffs in relation to the size of the heating unit(s).

(b) The swimming pool and the spa pool shall be separate. A spillway between the two pools is acceptable.

(c) The water reticulation system associated with the swimming and spa pools shall be so controlled and suitably interlocked with the change-over switch and arranged so that when supply is available at an Off-Peak Tariff, the heating unit only heats the main pool at that tariff. When supply is not available to an Off-Peak Tariff, the heating unit is then available to heat the spa pool at Domestic Tariff.

11. PROTECTIVE DEVICES OF WATER HEATERS ASSOCIATED WITH SWIMMING POOLS OR SPAS

11.1 Instantaneous type water heaters intended for connection in a swimming pool or spa water line are normally vented to the atmosphere but may be rendered an unvented water heater by the use of valves, flow switches and the like incorporated in the water reticulation system. Such water heater shall be provided in accordance with the relevant requirements of Australian Standard 3142 with each of the following protective devices:-

(a) A pressure relief valve; and

(b) A supplementary protective device which shall take the form of:-

- (i) a thermal protective device intended to disconnect the electricity supply; or
- (ii) a pressure relief disc; or
- (iii) a fusible plug; or
- (iv) other approved arrangement which is not a relief valve.

Where a thermal protective device is fitted, it shall not be the automatically resetting type and any manually resetting mechanism shall not be accessible from the exterior of the heater without the use of tools.

11.2 Unvented storage water heaters shall be fitted as required by AS3142 with the following devices:-

(a) An over-temperature energy cut-out or cut-outs operating directly in the circuit wiring to the elements.

(b) A temperature and pressure operated relief valve or valves rated to suit the particular water heater.

12. REQUIREMENTS FOR INSTALLATION OF A CONTACTOR

Service and Installation Rule 3.9, provides that:-

Where, in accordance with the provisions of any tariff published by the Council, electricity is to be supplied only during certain hours, the Council will provide and install a single pole control device capable of directly controlling loads supplied under that tariff, up to a rating of 25 amperes.

Where the controlled load exceeds 25 amperes or involves the switching of more than one phase of supply, the customer shall provide and install a contactor arranged so that it is operated by the Council's control device. The contactor shall be of an approved type suitable for sealing and shall be installed at the meter position. The customer shall also install the necessary wiring and ensure that the contactor is satisfactorily maintained.

A contactor is also necessary where motor starting currents are involved.

Information regarding requirements for installation of a contactor where the controlled load does not exceed approximately 80 amperes per phase is set out in Drawing E.I. 104 attached to Publication E.I. 7. Where the controlled load is metered using current transformers, Drawing E.I. 114 which is attached to Publication E.I. 18 applies.

13. OFF-PEAK STORAGE WATER HEATER CASH SUBSIDY/LOAN SCHEME

On 15th May, 1985, The Sydney County Council commenced a cash subsidy and interest free loan scheme to promote the installation of off-peak storage water heating systems. Under the scheme, the Council will pay $100 cash grant and if the customer wants it, a $100 interest free loan towards the cost of purchase and installation of a storage water heater connected at either Off-Peak Tariff 1 or Off-Peak Tariff 2 in new domestic premises and existing domestic premises, where off-peak supply has not previously been taken.

13.1 ELIGIBILITY

13.1.1 Customers can choose the cash grant with or without the interest free loan. An appropriate application form must be submitted by the customer and a Ready for Test Certificate received from the registered electrical contractor responsible for the installation.

In addition, the water heater must comply with the conditions of off-peak tariffs as specified in Council's Schedule of Electricity Charges and be installed in accordance with the installation instructions supplied with the heater and the Council's Service and Installation Rules.

13.1.2 The $100 cash grant will be paid to customers or, if authorised by the customer, to developers, builders or contractors.

The $100 interest free loan is repayable by four or eight equal quarterly instalments, as part of the usual electricity bill. Consequently, the loan is available only to Sydney County Council customers responsible for electricity accounts in premises in which an eligible off-peak water heater is installed or to owners of such premises who are Sydney County Council domestic customers living elsewhere.

13.1.3 Heat pump storage water heaters, as referred to in Clause 6.2 above and supplied at an Off-Peak Tariff, are eligible for the cash subsidy/loan.

13.2 APPLICATIONS

13.2.1 New Premises

In the case of new premises, the owner or builder would normally complete the application form for the grant/loan.

A builder, constructing and financing homes for sale, may lodge an application prior to the connection of the storage water heater, the connection subsequently being made in the name of the new owner. In such cases, the cash grant shall be paid to the builder.

Where a builder is building a home under contract for an owner, the grant shall be paid to the owner of the premises.

If the builder claims that the grant has been allowed for in the estimate of cost of the new home submitted to the owner, payment of the grant will be made to the builder provided that the owner/applicant specifies this in the application form.

13.2.2 Existing Premises

In existing premises, the grant/loan will normally be paid to the applicant who will generally be the owner of the premises.

However, a plumbing or electrical contractor may adjust his account to the customer relative to the grant/loan for which the customer is eligible and Council will make the cheque payable to the contractor provided that the customer authorises such action by completing and signing the appropriate section in the application form.

13.3 EXISTING STORAGE WATER HEATERS

Where an existing electric storage water heater previously not connected to an off-peak tariff is modified to be eligible for connection at an off-peak tariff, the amount of the grant/loan payable for such conversion shall be determined by the cost of the conversion up to the full amount of the grant/loan ($100/ $100). A detailed statement of the installing contractors account for the work carried out must be submitted.

13.4 PAYMENT

Council will pay the grant/loan promptly by cheque following the actual connection of the eligible heater.

13.5 APPLICATION FORMS/ENQUIRIES

Application forms are available from Council's Head Office Customer Service Centres, Customer Supply and Service Offices or by mail.

For further information or when requesting application forms, please telephone 266 0033. Customers in the Brisbane Water Area should telephone (043) 25 8535.

14. ISSUE

This publication supersedes the publication issued with the same number and title dated May, 1986.

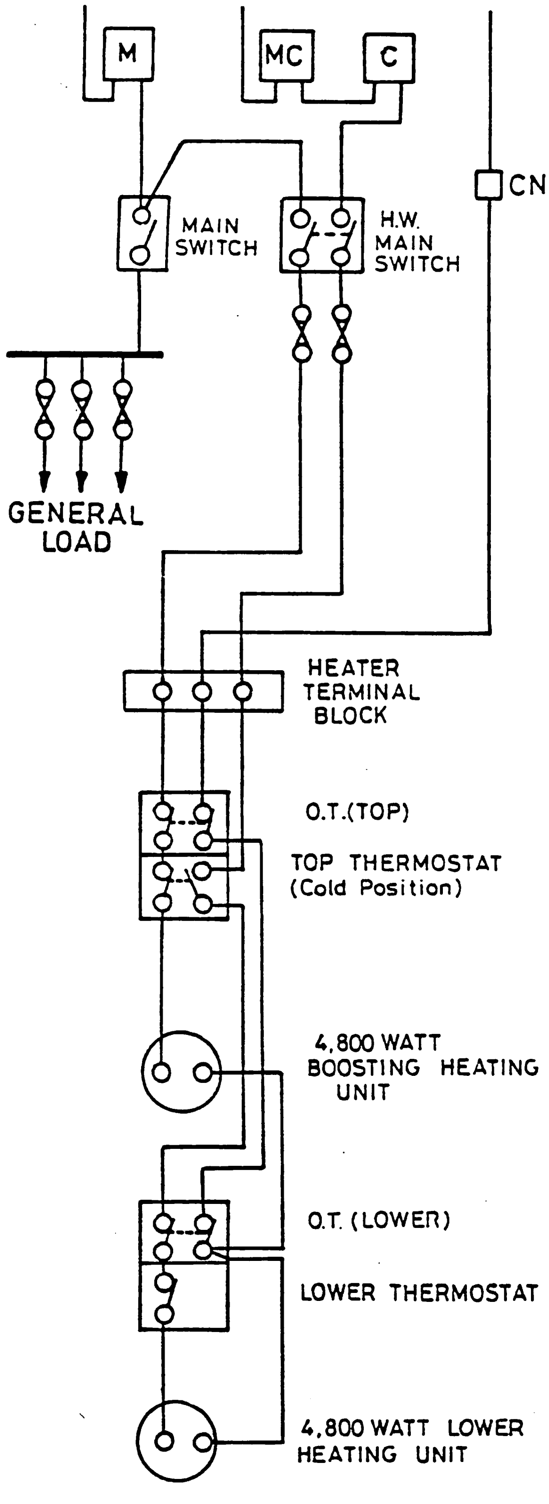

M
MC
C
CN
MAIN SWITCH
H.W. MAIN SWITCH
GENERAL LOAD
HEATER TERMINAL BLOCK
O.T.(TOP)
TOP THERMOSTAT (Cold Position)
4,800 WATT BOOSTING HEATING UNIT
O.T. (LOWER)
LOWER THERMOSTAT
4,800 WATT LOWER HEATING UNIT

FIGURE 1

WITH TOP BOOSTING HEATING UNIT

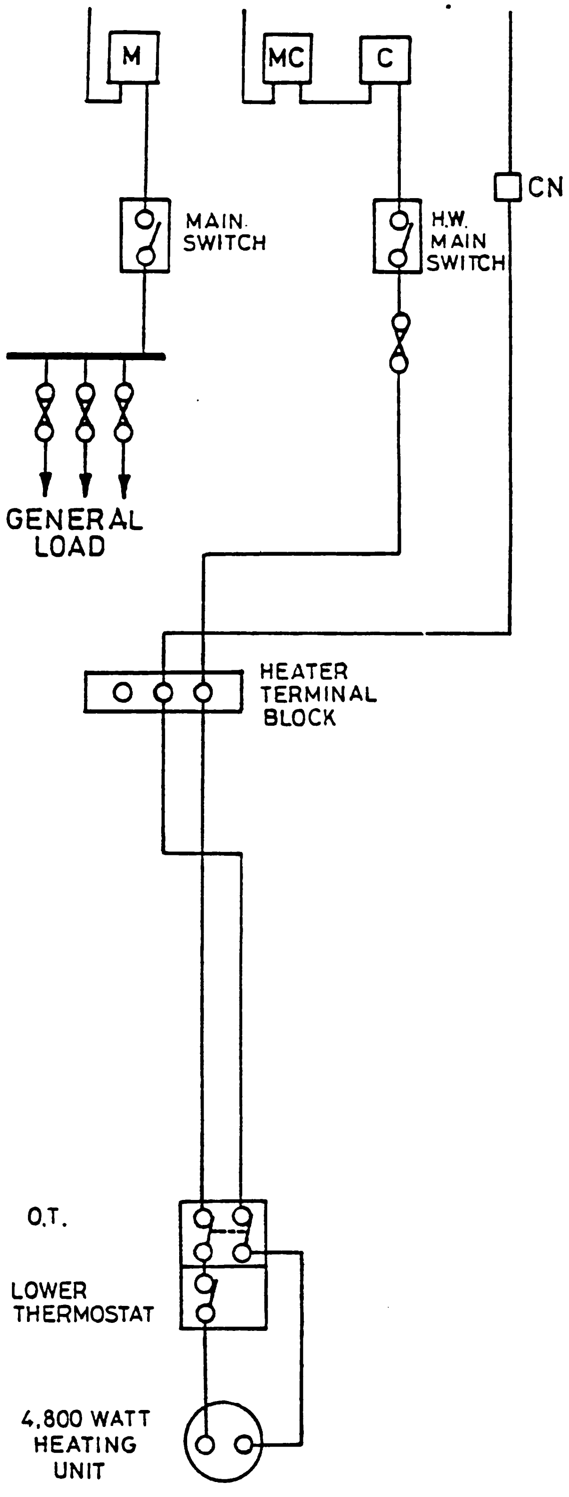

M
MC
C
CN
MAIN SWITCH
H.W. MAIN SWITCH
GENERAL LOAD
HEATER TERMINAL BLOCK
O.T.
LOWER THERMOSTAT
4,800 WATT HEATING UNIT

FIGURE 2

WITHOUT TOP BOOSTING HEATING UNIT

LEGEND

M – Principal tariff meter
MC – Off Peak tariff meter
C – Council's control device
CN – Customer's neutral link

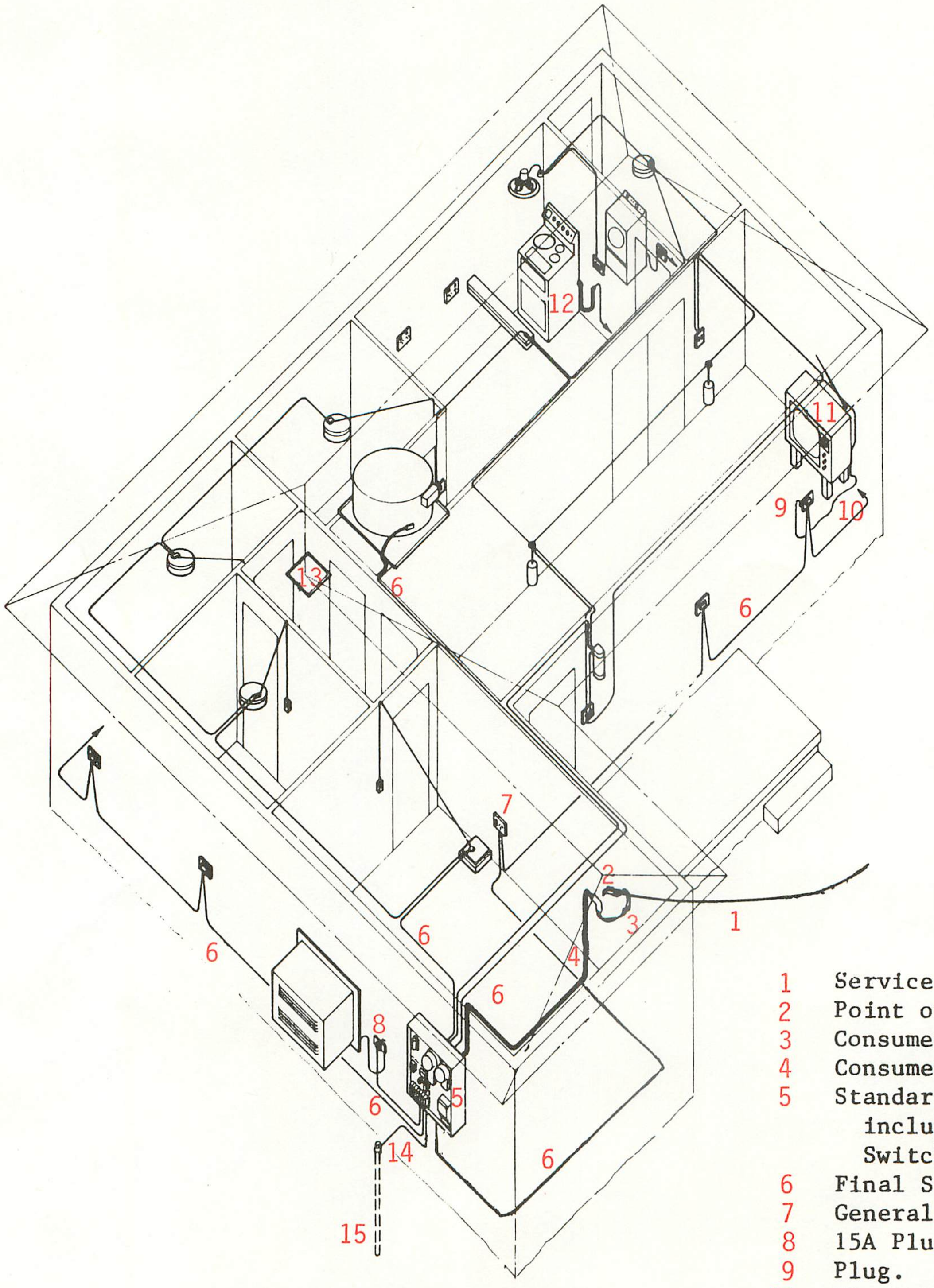
O T – Overtemperature energy cut-out relay. (Not required if tank is freely vented to atmosphere)

TYPICAL WIRING DIAGRAMS FOR DOMESTIC STORAGE WATER HEATERS

No. E.I. 13

SEPTEMBER, 1985

Domestic Electrical Installations



1	Service Line.
2	Point of Attachment.
3	Consumers Terminals.
4	Consumers Mains.
5	Standard Meter Box including Main Switchboard.
6	Final Sub-Circuit.
7	General Purpose Outlet.
8	15A Plug Socket.
9	Plug.
10	Flexible Cord.
11	Stationary Appliance.
12	Fixed Appliance.
13	Manhole.
14	Main Earthing Conductor.
15	Earth Electrode

No. E.I. 13

SEPTEMBER, 1985

Domestic Electrical Installations

1. SCOPE

This publication briefly explains the terms used in describing a typical domestic electrical installation and provides general background information.

2. COMPONENT PARTS OF A DOMESTIC INSTALLATION

A typical single domestic installation is illustrated on the cover. The following notes relate to components listed.

1. Service Line. These are the conductors installed by the Council between its supply mains in the street and a point of attachment on the customer's premises. Insulated cables have been used for some years but earlier practice was to use conductors having a covering which does not provide full insulation and additional care is necessary if working near them.

   Where the mains in the street are underground, the Council installs an underground service cable in a conduit which the customer is required to provide and install.

2. Point of Attachment. This is the point at which the aerial conductors of the service line or aerial consumers mains are attached to a customer's building, post, pole, or structure. The location is determined by an officer of the Council who also indicates the provisions which must be made by the customer to enable the Council to securely anchor the insulators which it installs to support the service line.

   The position selected for the point of attachment will depend on such factors as the profile of the terrain, the presence of obstructions and the relative positions of the building and street mains. Typical locations selected by the Council's officer for the point of attachment are the house eaves or gable, or on a service post near the boundary of the property.

   In some cases, it may be necessary to install a service bracket at the eaves to raise the line sufficiently to maintain minimum safe clearances above the ground or driveway. Service brackets are required to be of one of a number of approved types available from trade suppliers.

   It is important for the customer's builder to ensure that the structure supporting the anchor bolts or service bracket is adequate in strength to withstand the tension of the service line.

3. Consumers Terminals. These are the junction between the conductors of the service line and those of the consumers mains. The making of this connection and the carrying out of any other work at the consumers terminals must be carried out by Council staff only.

4. Consumers Mains. These are the cables which are installed by a licensed electrical contractor engaged by the customer. They commence at the consumers terminals, are connected to the Council's service fuses and link and terminate at the customer's main switchboard.

5. Main Switchboard and Meter Panel. The Council generally requires the use of a standard hinged pre-drilled panel, complete with the required arrangement of fully-connected socket bases for the mounting of the Council's plug-in meters and control equipment. Customers are advised to use a panel which bears a mark indicating that it is made by a manufacturer listed by the Energy Authority of New South Wales and complies with the Authority's published standard. These panels and associated meter boxes and surrounds are available from trade suppliers. However, if the residence has a very large electrical installation, the standard panel may not be adequate and a larger panel and separate facilities for the mounting of service fuses may be required.

   The panel is required to be protected from the weather and is generally enclosed in a weatherproof meter box as indicated in the illustration. It is preferred that use be made of a standard meter box which bears a mark indicating that it is made by a manufacturer listed by the Energy Authority of New South Wales and complies with its published standard. However, other forms of construction are acceptable if they are equivalent to the standard box in all relevant respects.

   The Council installs its service fuses, neutral link, plug-in meter(s) and associated equipment on this panel. Adequate space is generally also available for the customer's switchboard equipment necessary to control and protect the sub-mains and final sub-circuits.

6. Final Sub-Circuit. These are the various cables which originate at the switchboard and to which consuming devices are intended to be connected. A final sub-circuit may supply, for instance, a number of luminaires, or a number of general purpose outlets, or a 15 ampere plug socket, or a permanently-connected appliance.

7. General Purpose Outlets. These are plug sockets having a rating of 10 amperes and intended for the connection of appliances and luminaires fitted with a flexible cord and plug. Outlets installed solely for a particular fixed or stationary appliance or luminaire are defined as plug sockets.

8. 15 Ampere Plug Sockets. These are generally used for the connection of appliances such as package air conditioning units rated between 10 amperes and 15 amperes (2 400 and 3 600 watts). A special 15 ampere plug which cannot be inserted in a 10 ampere outlet must be fitted to such appliances.

9. & 10. Plugs and Flexible Cords. These terms being in common use, descriptive information is considered unnecessary.

11. Stationary Appliances. These are appliances which are fixed in position or cannot easily be moved from one place to another.

12. Fixed Appliances. These are appliances such as cooking ranges and water heaters which are either built into the structure or are fastened or otherwise secured at a specific location. The wiring is normally terminated directly within the appliance.

13. Manhole. Access must be provided to electrical equipment installed in enclosed spaces such as between the roof and the ceiling or under the floor. The entry aperture should be in a convenient position and the dimensions of the opening must not be less than that required by Australian Standard AS3000.

14. Main Earthing Conductor. This is the earthing conductor installed directly between the main neutral link and the earth electrode. (Where the metallic piping of any water supply system, any portion of which is underground is installed within the building, it shall be bonded to the main earthing conductor).

15. Earth Electrode. This is the means of connecting the earthing system of the installation to the general mass of earth.

3. WORK ON CUSTOMERS' INSTALLATIONS

Under State Legislation, work carried out on a customer's installation is required to comply with Australian Standard AS3000 - "Rules for the Electrical Installations of Buildings, Structures and Premises", commonly known as the "SAA Wiring Rules". Persons carrying out such work are required, with certain minor exceptions to provide the supply authority concerned with written particulars within 14 days of the completion of this work.

These Rules set down the essential requirements for ensuring safety from fire and shock and apply to all electrical installations on customers' premises. Customers are advised to obtain the services of a licensed electrical contractor where any work is necessary on their electrical installation.

4. APPLICATION FOR SUPPLY

Where supply is required to a single domestic residence, the customer, builder, or his electrical contractor should apply for supply by completing an "Application For Supply Of Electricity". Following the receipt of this form, an officer of the Council visits the premises and "marks" the service. That is, he selects the location of the point of attachment and the meter box and determines any requirement for a post or service bracket.

5. FURTHER INFORMATION

Reference should be made to Section 0 of the SAA Wiring Rules, AS3000, for full definitions of terms used and to the publication E.I. 7 - "Provisions for Service Equipment in Single Domestic and Small Installations" for detailed information concerning the Council's requirements.

This publication supersedes that of the same number, dated February, 1979.

THE
SYDNEY
COUNTY
COUNCIL

No. E.I. 14

JUNE, 1979

Current Rating Of Electrical Equipment

The passage of an electric current heats the conductor carrying it. The temperature attained will depend upon the differential between the heating effect of the internal energy losses and the dissipation of this heat to the surroundings. If this temperature becomes excessive, the equipment containing the conductor will fail. To prevent this condition arising, electrical equipment is assigned a current rating.

Assigning the Current Rating

A current rating is obtained by determining the upper limit of temperature at which equipment can safely operate and the current required to raise it to that temperature.

An equipment item contains a number of current carrying, and therefore heat generating parts in proximity to heat affected parts. Their individual relationship and their combined relationship to the external environment must be considered when setting the temperature limit. For illustration consider an electric radiator. The element is intended to generate heat hence the insulation in the immediate vicinity must be highly heat resistant. The terminals for connecting the external flexible cord are not heat generators to the same extent as the element, hence their supporting insulation need not be so highly heat resistant. However space restrictions may require the terminals to be in close proximity to the element and receive a degree of radiant heat. Or there may be heat conduction along the internal wiring. Consequently, the heat resistance ability of the terminal insulation may have to be increased beyond what otherwise would be required. Finally, the proximity of the element to the surroundings, that is the floor or wall, will have a bearing on the allowable element temperature which in turn has an effect on the insulation.

Consider now a simple equipment item such as a switched socket outlet. This is not intended as a heat generator and the operating temperature will be such as to permit reasonable dimensioning of the parts, economical use of insulation and safety (in respect of ignition) of the mounting locality. An allowance will also be made for the switch contacts becoming less effective through age and wear and thus more heat generating.

It can be seen that selection of the rating temperature depends upon a number of factors - usage, material availability, characteristics, cost, etc. In the complicated example of the radiator, more than one temperature would be involved. In the case of a simpler component a single temperature would probably suffice.

After the upper temperature limit has been selected, a complete unit is tested to ensure it complies. For uniformity, the temperatures and conditions under which equipment items are tested are specified in National Standards.

The Work Situation

Equipment is often used under different conditions to those specified for the standard test, which is usually performed in free air on the isolated item. Under working conditions equipment may be enclosed and grouped with other equipment. The enclosure restricts the air flow and impairs the transfer of heat. The ambient temperature within the enclosure, augmented by the heat generated by the other items reaches levels outside those allowed in the Standard. Heat can be radiated from one group to affect another.

Equipment connections can be different. If these are smaller than in the test, or taken to other equipment items which themselves run at a high temperature, heat conduction away from the equipment is impaired or blocked.

All these effects can be allowed for by good design, enclosures can be ventilated, connections increased in size and equipment items spaced to reduce mutual heating. These points will be considered in greater detail later.

Effects of Overheating

Long lengths of conductor are subject to correspondingly large expansions. In the case of busbars, this can result in insulator failure from mechanical overstressing. Expansion of cables can result in the crushing of insulation which may already be softened by the heating.

Heat accelerates oxidation of ineffective contact surfaces. This increases contact resistance thereby producing more heat and eventual failure.

Insulation may be charred to the point of ineffectiveness or be softened to the extent that it migrates away from the conductor.

Fuses

Fuses depend for their operation on heat generation. The fusible element is required to melt before damage occurs to the connected circuit. The element is generally of a smaller cross-section than the connected circuit, consequently the resistance is greater, heat generation is faster and the bulk to be heated to melting point is smaller. As a result the element operates at a higher temperature than the connected circuit under normal loading conditions.

The heat will be conducted away to the contacts and connections which can be expected to operate at their maximum allowable temperature.

Contacts

Contacts, whether on fuse or switch, are intended to be movable. Hence contact surfaces are continually varying in efficiency which to some extent is dependent upon surface condition and pressure, usually provided by some form of spring.

Overheating can affect spring temper, reducing contact pressure which ultimately results in the generation of further heat. Electromagnetic forces arising from throughfault conditions may overcome the reduced spring pressure causing arcing and hence impairment of the contact surface.

Contacts requiring manual alignment, e.g. fuse carriers, are subject to mishandling resulting in spreading contacts, weakened springs. Arcing may result. This type of treatment is not a pre-condition to any standard test.

Application

When equipment is used in a work situation consideration must be given to the overall design and allowances to be made for design or other deficiencies. A design which provides for realisation of ultimate current ratings may be too costly in space. An economical space design on the other hand may mean unattainable current ratings, so-called de-rating. A good design is a successful blending of the two requirements. A few of the factors likely to be encountered are given below.

When equipment items are grouped in close proximity mutual heating can occur by radiation across the intervening gap. If the items are touching, heat is conducted from one item to another. Air flow around the items is impeded by proximity and this method of heat removal is impaired. If items are mounted one above the other, heat can be transferred from the lower to upper item by the rising heated air flow. Proximity also shortens electrical interconnections between units which favours heat conduction along the connection.

When equipment items are enclosed the overall air circulation is impaired and the heat must be transferred to the surroundings, at a slower rate, through the enclosure material. Metal enclosures are better heat conductors than timber. However, they also allow heat to reach the equipment from solar radiation, a point to be considered when mounting equipment outdoors. Heat transfer can be improved by painting with matt paints, preferably dark in colour, and decreased by the use of smooth, light or polished surfaces.

To realise the current rating of an item fully, it must be operated in a condition resembling as closely as possible the one in which it obtained its rating. In most cases this is impracticable and some measure of de-rating will have to be made. However, this can be minimised by suitable precautions. Their nature is suggested in the comments above.

Grouped items should be spaced to permit adequate air flow between them. Preferably items should not be placed over one another but when this cannot be avoided those generating most heat should be located at the top. Item bulk should be considered. A large item above a smaller one affects the rising column of heated air. In some instances this may conflict with the previous statement in which case the disadvantages of each method of mounting will have to be assessed.

Enclosures should be selected with the conflicting requirements of inward/outward heat transfer in mind. For example, in sunny locations a light wooden box, or light painted metal box with thermal insulation would be preferred. To allow the heat to escape, the enclosure could be ventilated by suitably protected openings which would permit a through air flow while still intercepting solar radiation. For indoor use a dark matt painted metal enclosure would be most suitable. Contrary to popular belief, gray paint has a comparable thermal emissivity to lamp black. A space should be provided between the uppermost items and the top of any enclosure to accommodate any pocket of hot air.

Equipment wiring should always be arranged so that there is no pressure between adjacent conductors. The worst pressures are experienced between conductors at right angles, since the area of resistance to the force is a minimum, almost point contact in effect. Adequate space should be allowed behind enclosure covers or hinged panels so that wiring will not be forced into close contact, either mutual or with fixed items, when the cover or panel is closed. At such times what is occurring cannot be seen. Wiring should be fixed in position - space adequate for wiring separated and fixed in some semblance of order can be totally inadequate when it is loose and inadvertently moves to occupy one section of the space. A common fault to be found is a mass of loose wiring behind a panel or door which has to be forced to permit closure.

Another common failing is inadequate fixing of wiring between items with relative movement. Wiring taken to equipment items on hinged panels from conduits etc., is generally allowed to hang free from the equipment terminals. Even if sufficient length is left so that opening the panel does not put a strain on the conductors, the twisting motions involved can loosen the conductors in the terminals. This will ultimately cause failure by rise in contact resistance. If bad enough, arcing can lead to risk of fire. An appropriate precaution would be to fix the conductor to the panel adjacent to the terminal, thus avoiding relative motion.

When it is not possible, convenient or economical to operate equipment in the manner in which it obtained its rating, it is necessary to consider making some allowance. This is called de-rating. Unfortunately while some guidance can be obtained from the Wiring Rules for some items, in most cases it will have to be a matter of common sense, and possibly some form of empirical rule-of-thumb. It is advisable to de-rate to some extent, items which are prone to contact deterioration during service or which are heat generating to a greater degree than usual. A common item coming within this category would be carriers and fuse bases of re-wirable fuses. If the nature of the load is such that it is sustained for some length of time, it is sound practice to use a carrier and base with a higher rating than the nominal circuit loading. Some authorities recommend a factor of two - which may not always be possible. It must be remembered that this factor applies solely to the carrier and base and not the fuse element which must not be increased in rating.

This publication is a re-print of the publication issued with the same number and title in July, 1977.

SYDNEY
COUNTY
COUNCIL

No. E.I. 18

SEPTEMBER, 1983

Metering Which Requires The Use Of Current Transformers

CONTENTS

1. SCOPE.

2. GENERAL.

3. FACILITIES REQUIRED FOR INSTALLATION OF METERS.
  3.1 C.T. METERING PANEL.
  3.2 LOCATION AND ACCESS REQUIREMENTS.

4. FACILITIES REQUIRED FOR INSTALLATION OF CURRENT TRANSFORMERS.
  4.1 GENERAL.
  4.2 STANDARD C.T. UNIT FOR WALL MOUNTING.
    4.2.1 General.
    4.2.2 Mounting.
    4.2.3 Primary Conductors.
    4.2.4 Connection Bars and Terminals.
  4.3 INSTALLATION IN A SWITCHBOARD ENCLOSURE.
    4.3.1 Location and Access Requirements.
    4.3.2 Mountings.
    4.3.3 Primary Conductors.

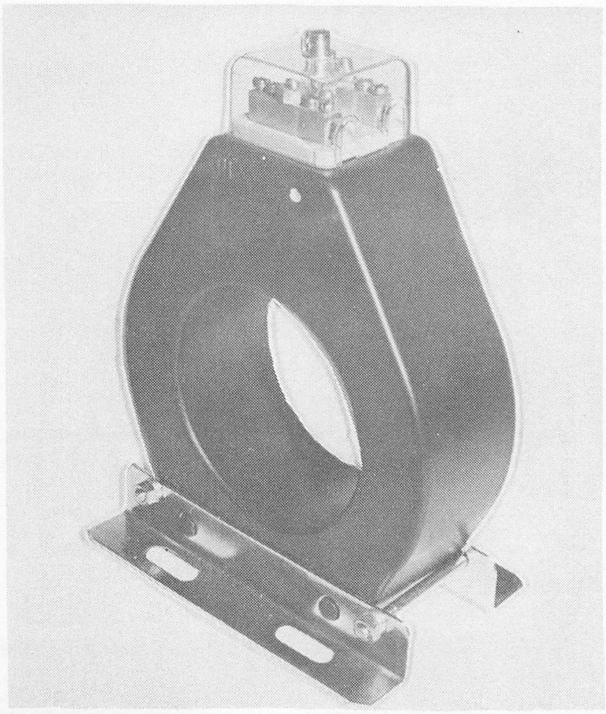
5. FACILITIES REQUIRED FOR THE CONNECTION OF METERING EQUIPMENT.
  5.1 GENERAL.
  5.2 CURRENT-CIRCUIT WIRING.
  5.3 VOLTAGE-CIRCUIT WIRING.
  5.4 WIRING BETWEEN LOAD CONTROL DEVICE AND CONTACTOR.
  5.5 EARTHING CONNECTION.
  5.6 SUMMATION-EQUIPMENT WIRING.

6. CONTROLLED LOAD.

7. DRAWINGS.

8. FURTHER INFORMATION.

9. ISSUE DATE.



THE
SYDNEY
COUNTY
COUNCIL

No. E.I. 18

SEPTEMBER, 1983

Metering Which Requires The Use Of Current Transformers

1. SCOPE

This publication sets out the provisions which the customer is required to make, in addition to those indicated in other E.I. Series Publications, in those cases where the installation of metering instruments which operate in conjunction with current transformers is necessary in order to meter a supply at 415/240 volts.

2. GENERAL

Metering instruments operating in conjunction with current transformers will generally be used when it is anticipated that the maximum demand of an installation or portion of an installation which is to be separately metered will exceed 100A per phase. In addition to providing facilities in accordance with publication E.I. 8 for the Council's service fuses and for any direct-connected meters necessary, the customer shall provide facilities for mounting and connecting the current transformers, meters and associated equipment in accordance with this publication and the Notice given by an officer of the Council.

All work shall be carried out in accordance with the Council's Service and Installation Rules, the SAA Wiring Rules and this publication. The Council provides and connects the metering instruments, associated test blocks, current transformers and voltage-circuit fuses, using the wiring and other provisions for their installation provided by the customer.

3. FACILITIES REQUIRED FOR INSTALLATION OF METERS

3.1 C.T. METERING PANEL. In respect of each separately metered portion of the installation for which current transformer metering is necessary, the customer shall provide and install a 450-460mm high x 600-610mm wide meter panel of insulating material hinged on the left or right-hand side mounted on a surround made of 1mm (min.) zinc-coated steel to provide a clear depth of 75mm (min.) behind the panel. The panel and surround shall comply with the requirements of the SAA Wiring Rules for hinged switchboard construction. Where Demand Tariff summation metering is applicable, the customer shall provide and install an additional panel for summation equipment.

3.2 LOCATION AND ACCESS REQUIREMENTS. The C.T. metering panel shall be installed by the customer undrilled except for holes for hinges and securing screw(s). Council staff will carry out all further work required on the panel. In some circumstances, the panel will be exchanged for one which has been equipped.

The Council's officer will indicate the position required. In general, the panel must be located so that no portion of it is lower than 600mm or higher than 2500mm from the ground or floor level where it is installed. A clearance of 250mm (min.) is required from the face of the hinged panel to the inside face of any enclosure provided for it and also 200mm from the face of the panel to any fixed object when the panel is open 90° on its hinges.

The requirements set out in Section 5 of the publication E.I. 8 relating to the installation, grouping, accessibility and protection of meters from weather etc. and the means of fixing meter panel surrounds to walls apply. Attention is also drawn to requirements for spacing between meters and current-carrying conductors set out in Section 7 of the publication E.I. 8.

4. FACILITIES REQUIRED FOR INSTALLATION OF CURRENT TRANSFORMERS

4.1 GENERAL. For installations and separately metered portions of installations with a maximum demand of up to 600A per phase, the Council is prepared to install the standard C.T. unit (See 4.2) on battens fixed to a wall by the customer in a position nominated by the Council's officer.

Alternatively, if the customer decides to install a cubicle-type switchboard, the Council provides the switchboard manufacturer, at the customer's request, with the metering current transformers and the voltage-circuit fuse assembly so that this equipment may be incorporated in the customer's switchboard. If the customer has a preference for this arrangement but has been notified initially to provide for the installation of the standard C.T. unit, he is requested to advise the Area or District Office accordingly, so that the change of arrangements can be made.

In both cases, the Council makes all connections to its current transformers and voltage-circuit fuses using wiring installed by the customer in accordance with Section 5 of this publication.

Relevant details are set out in drawings listed in Section 7.

4.2 STANDARD C.T. UNIT FOR WALL MOUNTING

4.2.1 General. The standard C.T. unit comprises a set of three type S or type A current transformers and a voltage-circuit fuse assembly, mounted on a panel and provided with a cover. It is designed for wall mounting immediately above or below a 200-400A service fuse cabinet so that the load terminals in the cabinet are adjacent to it.

It may also be used to meter loads of up to 600A per phase utilising terminals of equipment provided and installed by the customer. Limitations apply to the choice of primary conductors and methods of termination and are dealt with in Clause 4.2.3.

The Council's officer will indicate the position required for the unit. The arrangement is required to comply with the following:-

i) The length and arrangement of cable between each current transformer and the corresponding line-side terminal must be sufficient to permit flexing without tight bending of the cable when installing transformers. This length shall not exceed 1 metre.

ii) The line side terminals for the connection of cables passing through current transformers must be located no higher than 2700mm and no lower than 450mm from the ground, floor or platform from which access is obtained.

iii) No portion of the C.T. unit is permitted to be higher than 2500mm or lower than 450mm above the access level.

iv) Adequate clearances shall be provided in order to facilitate handling of the standard C.T. unit with all equipment mounted.

v) The arrangement shall obviate any need for taping or applying an encapsulating material to any connection which would have to be separated in order to remove a current transformer.

vi) Each cable shall terminate in a separate lug. If the cable is terminated in a soldered or crimped lug, the lug shall be of dimensions which enable the current transformer to pass over it. If two cables pass through the current transformer, the lugs attached by the customer shall be such that the current transformer can pass over both lugs together.

vii) With the exception of stranded cables smaller than $95mm^2$, space not less than 300mm is required between the standard C.T. unit and the position where flexing of the cable is restrained by a conduit or other fixture or joint on the load side of the unit.

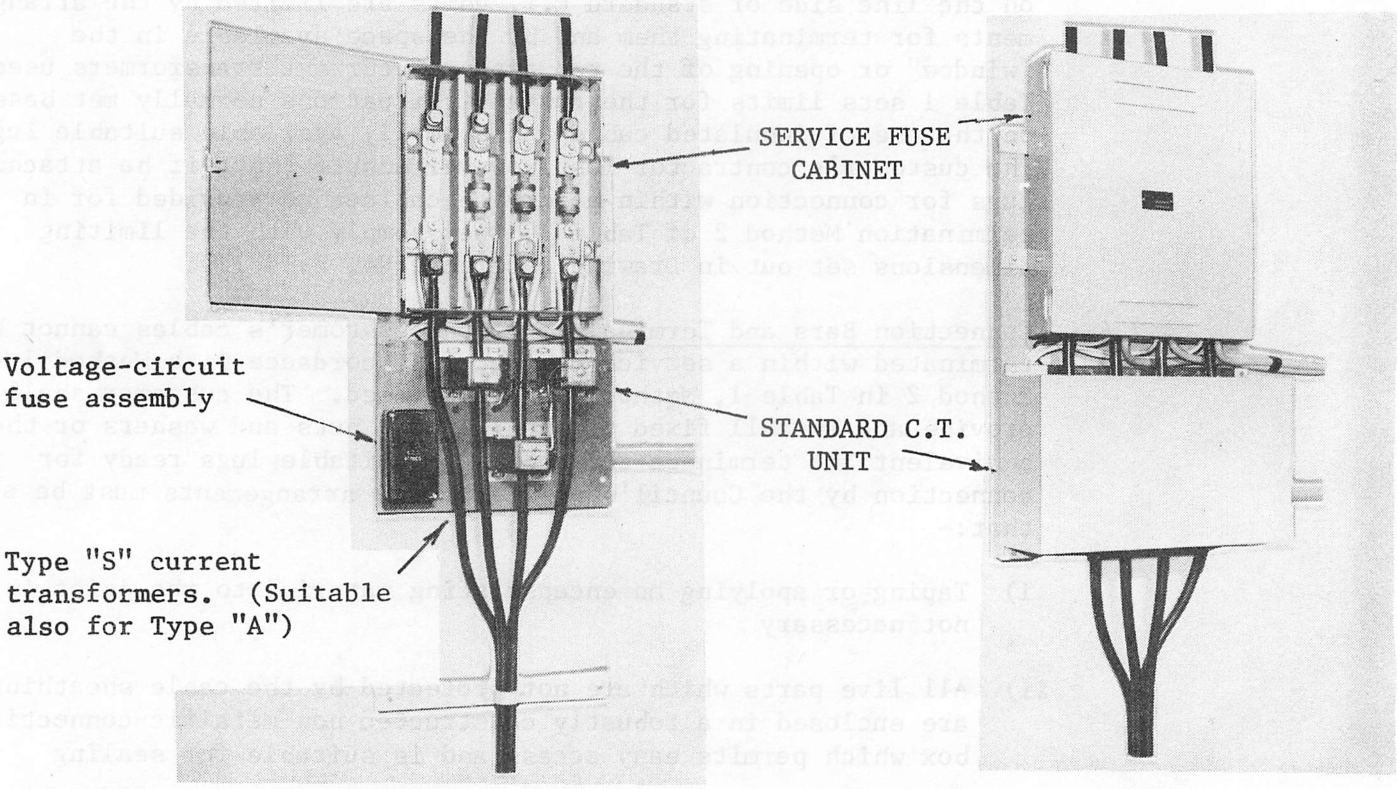

SERVICE FUSE CABINET
Voltage-circuit fuse assembly
STANDARD C.T. UNIT
Type "S" current transformers. (Suitable also for Type "A")

ILLUSTRATION 1. THE STANDARD C.T. UNIT USED IN CONJUNCTION WITH A 200-400A SERVICE FUSE CABINET.

4.2.2 Mounting. Where it is proposed to install the standard C.T. unit in conjunction with a service fuse cabinet, the Council's officer will include in the Notice the requirement that the customer shall supply and fix to the wall two 40mm x 40mm (finished dimensions) softwood battens in approximately the same vertical plane as the battens required for the service fuse cabinet. By providing longer battens, the same battens may be used for both the cabinet and a standard C.T. unit as in Illustration 1.

Fixings for the battens shall be at least two well spaced steel screws or bolts of 5mm (min.) nominal diameter with heads flush with the surface of the batten. If wall plugs are used, they shall be of a durable (preferably metallic expansion) type. Wooden wall plugs are not acceptable.

4.2.3 Primary Conductors. The customer shall install between the terminals on the line side of the standard C.T. unit and the customer's installation on the load side, insulated cables complying with the SAA Wiring Rules. If metal-sheathed cables are used, the sheath shall be removed where the cables pass through the C.T's.

Aluminium cables may be used only if the customer arranges for suitable copper or copper alloy lugs to be attached to them by soldering or aluminium-welded-to-copper (bi-metal) lugs by crimping or soldering.

The size and number of cables which may be terminated immediately on the line side of standard C.T. units are limited by the arrangements for terminating them and by the space available in the "window" or opening of the two types of current transformers used. Table 1 sets limits for the range of situations normally met based on the use of insulated cable and normally available suitable lugs. The customer's contractor must however ensure that, if he attaches lugs for connection within a service cabinet as provided for in termination Method 2 of Table 1, they comply with the limiting dimensions set out in Drawing Reference No. E.I. 110.

4.2.4 Connection Bars and Terminals. If the customer's cables cannot be terminated within a service cabinet in accordance with Method 1 or Method 2 in Table 1, Method 3 shall be used. The customer shall provide and install fixed terminal studs, nuts and washers or the equivalent and terminate the cables in suitable lugs ready for connection by the Council's officer. The arrangements must be such that:-

i) Taping or applying an encapsulating material to the joint is not necessary

ii) All live parts which are not protected by the cable sheathing are enclosed in a robustly constructed non-metallic connection box which permits easy access and is suitable for sealing

iii) Cables can be conveniently disconnected and moved clear to facilitate removal of the current transformers

iv) Slots or openings provided in the enclosure for this purpose shall be close-fitting around the cables and any removable barriers shall be contained within the enclosure.

An acceptable arrangement using "connection bars" as referred to in Clause 4.4.3 of publication E.I. 8 and a readily available moulded box made of glass-fibre-reinforced polyester is shown in Illustration 2.

TABLE 1

METHOD OF TERMINATING CABLES ON LINE SIDE OF STANDARD C.T. UNIT OR UNITS (Subject to requirements of Clause 4.2)	NUMBER OF CONDUCTORS PER PHASE	MAXIMUM CONDUCTOR SIZE (mm^2)	
1) On terminals within an S.C.C. service cabinet using stranded copper cable, clamped in the tunnel of a lug supplied by S.C.C.	**1	185	
*2) On terminals within an S.C.C. service cabinet with suitable copper, copper alloy or aluminium-welded-to-copper lugs supplied and attached by customer's contractor to meet requirements of Clause 4.2.3.	1	185; 300#	
	2 through 1 C.T.	50 + 50 or 70 + 35	120 + 120) or)# 185 + 70)
	2 through separate C.T.'s	185 + 185	
*3) On suitable enclosed, sealable terminals provided by the customer in accordance with Clauses 4.2.3 and 4.2.4 using suitable copper, copper alloy or aluminium-welded-to-copper lugs supplied and attached by customer's contractor.	1	185; 300#	
	2 through 1 C.T.	50 + 50 or 70 + 35	185 + 70) or)# 120 + 120)
	Where each is through a separate C.T. the limit is as for 1 conductor subject to customer providing satisfactory termination arrangements.		

NOTES

*Prior consultation with the Council's officer is necessary.

**In addition, the Council is prepared to connect one additional cable ($16mm^2$ min. and $35mm^2$ max.) for supply to a separate portion of the installation in accordance with Clause 4.4.3 of publication E.I. 8.

#Cable sizes and combinations marked with this symbol can be used only if Type 'A' current transformers are used. The customer's contractor should request them where necessary.

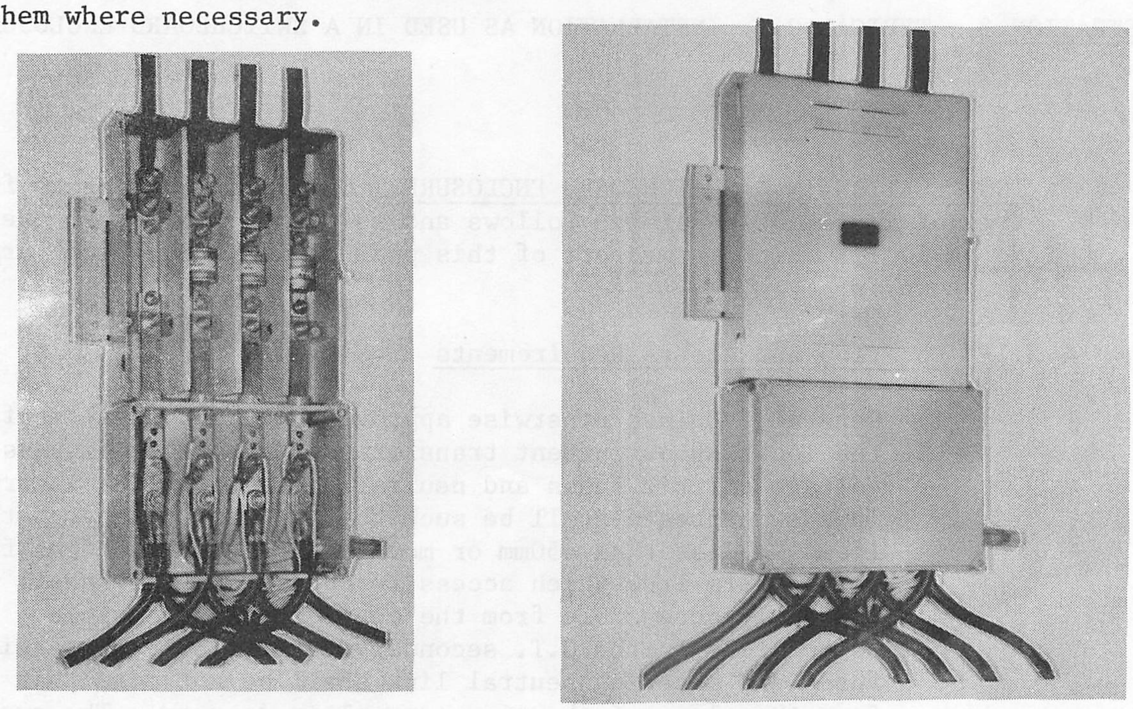
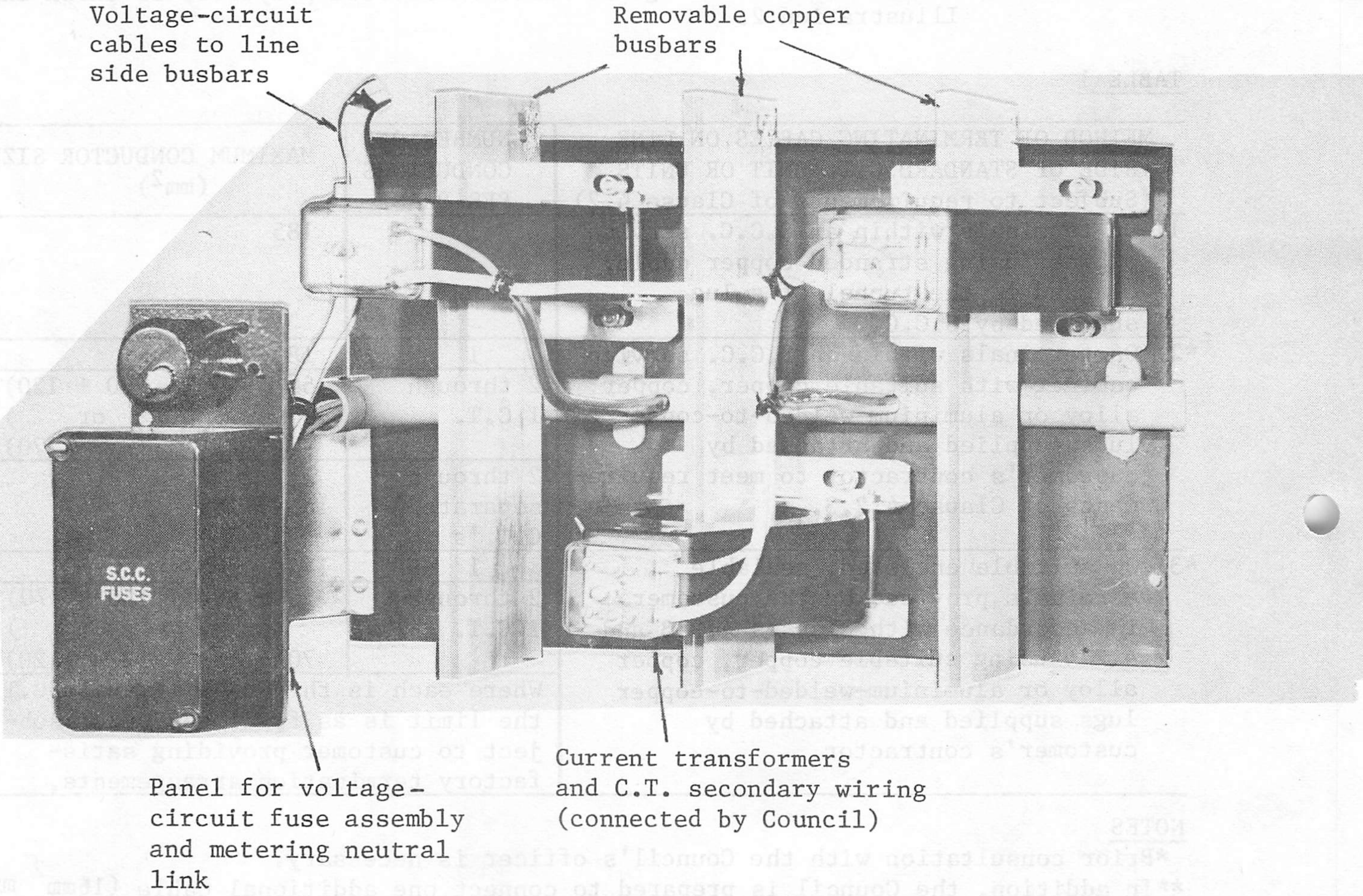


ILLUSTRATION 2. A CONNECTION BOX USED IN CONJUNCTION WITH A 200-400A SERVICE FUSE CABINET. (See 4.2.4).


Voltage-circuit cables to line side busbars
Removable copper busbars
S.C.C. FUSES
Panel for voltage-circuit fuse assembly and metering neutral link
Current transformers and C.T. secondary wiring (connected by Council)

Note: The required removable insulating screen is not shown.

ILLUSTRATION 3. TYPICAL C.T. INSTALLATION AS USED IN A SWITCHBOARD ENCLOSURE.

4.3 INSTALLATION IN A SWITCHBOARD ENCLOSURE. General requirements for this type of installation are as follows and as set out in drawing Reference No. E.I. 113 which forms part of this publication. A typical arrangement is shown in Illustration 3.

4.3.1 Location and Access Requirements

i) General. Unless otherwise approved by the Council's officer, the location of current transformers, removable busbars, voltage circuit fuses and neutral connecting link incorporated in a switchboard shall be such that no part of any of these items is less than 450mm or more than 2500mm from the floor or platform from which access is obtained. They shall be conveniently accessible from the outside of the cubicle. Connections to the C.T. secondary terminals, voltage circuit fuses and metering neutral link shall be not more than 300mm from the plane of the access panel or doorway. The access arrangements must also comply with Service Rule 3.5. Further requirements are as follows:-

ii) Safety Screen. All live conductors within 300mm of the current transformer secondary terminals, voltage-circuit fuses and metering neutral link shall be insulated or screened to prevent inadvertent contact with such conductors. Convenient access, however, is required for removal of the current transformers.

These requirements can generally best be met by having a readily removable screen of light insulating material with openings shaped to fit over the current transformers and associated wiring in such a way that the secondary terminals, voltage-circuit fuses and metering neutral link are accessible without removing the screen. The screen shall be fitted with two insulated handles and be secured to the framework of the switchboard.

Construction of the switchboard must be such that a tool or article accidently dropped by a person working on the connections with the screen in place, cannot fall from the C.T. compartment into other areas of the switchboard.

iii) Doors and Access Panels. Doors and access panels shall be provided with facilities for easy and safe opening or removal. If hinged, they shall be capable of opening to 90°.

Any access panel shall be not greater than 1 square metre in area. The length shall not exceed 1500mm. A handle shall be fitted to each side of the panel slightly higher than its horizontal centre line and fixings shall be such that the panel will remain in position when the fasteners are released or removed.

iv) Identification. The panel, whether hinged or removable, shall be marked "S.C.C. Metering C.T.'s enclosed" and shall also have sufficient additional information on it to clearly identify the associated customer and, if more than one tariff is involved, the relevant tariff. A similar identification label shall be fixed adjacent to the current transformers. Any identification tags or labels required by the Council for this purpose shall be provided and fixed by the customer as requested by the Council's officer.

v) Locking. Locking of the access panel is not required but is permitted provided that a standard Council lock is used. This may be purchased at any Customer Supply and Services Office.

vi) Sealing. Provision shall be made by the customer for the Council's officer to seal the C.T. compartment access door or panel. The facilities provided shall be suitable for sealing using short lengths of wire. One facility for sealing is required at the side of any door opposite to its hinged edge and at two approximately diagonally-opposite points on a removable panel.

4.3.2 Mountings. The mountings which are to be provided by the customer for the current transformers shall consist of 9mm dia. studs, secured by brazing or equivalent means to a mounting plate or bar, together with nuts. Alternatively, tapped holes at two diagonally opposite corners of a mounting plate and slotted or hexagon-head 9mm dia. set screws are acceptable, subject to dowels being provided at the other corners to support the current transformers during removal of the set screws.

A pre-drilled panel of insulating material shall be provided for the mounting of the voltage-circuit fuse assembly (and neutral link if requested) in an accessible position near the current transformers with which they are associated. The mounting panel shall be in approximately the same plane as the safety screen. A clearance of 100mm (min.) to 300mm (max.) shall be provided between it and the enclosure door.

Dimensions of current transformers are given in drawing Reference No. E.I. 111, "Metering Current Transformers, Principal Dimensions," which forms part of this publication.

4.3.3 Primary Conductors. The conductor passing through each current transformer may be either an insulated cable arranged so that the current transformer can be removed as described in Clauses 4.2.1 and 4.2.3 or, alternatively, may be in the form of a removable section of copper busbar enclosed within the switchboard.

The surfaces to which these conductors are to be connected shall be either copper or suitably plated copper or copper alloy.

Connection and disconnection shall not involve the use of tools other than an adjustable or socket type spanner.

The size and shape of the busbar shall be selected to suit the openings in the current transformers of the type nominated by the Council's officer.

The removable section of busbar shall be 300mm (min.) to 450mm (max.) in length. No wiring is permitted to be connected to the removable section of the busbar or the bolts or fixings which secure it.

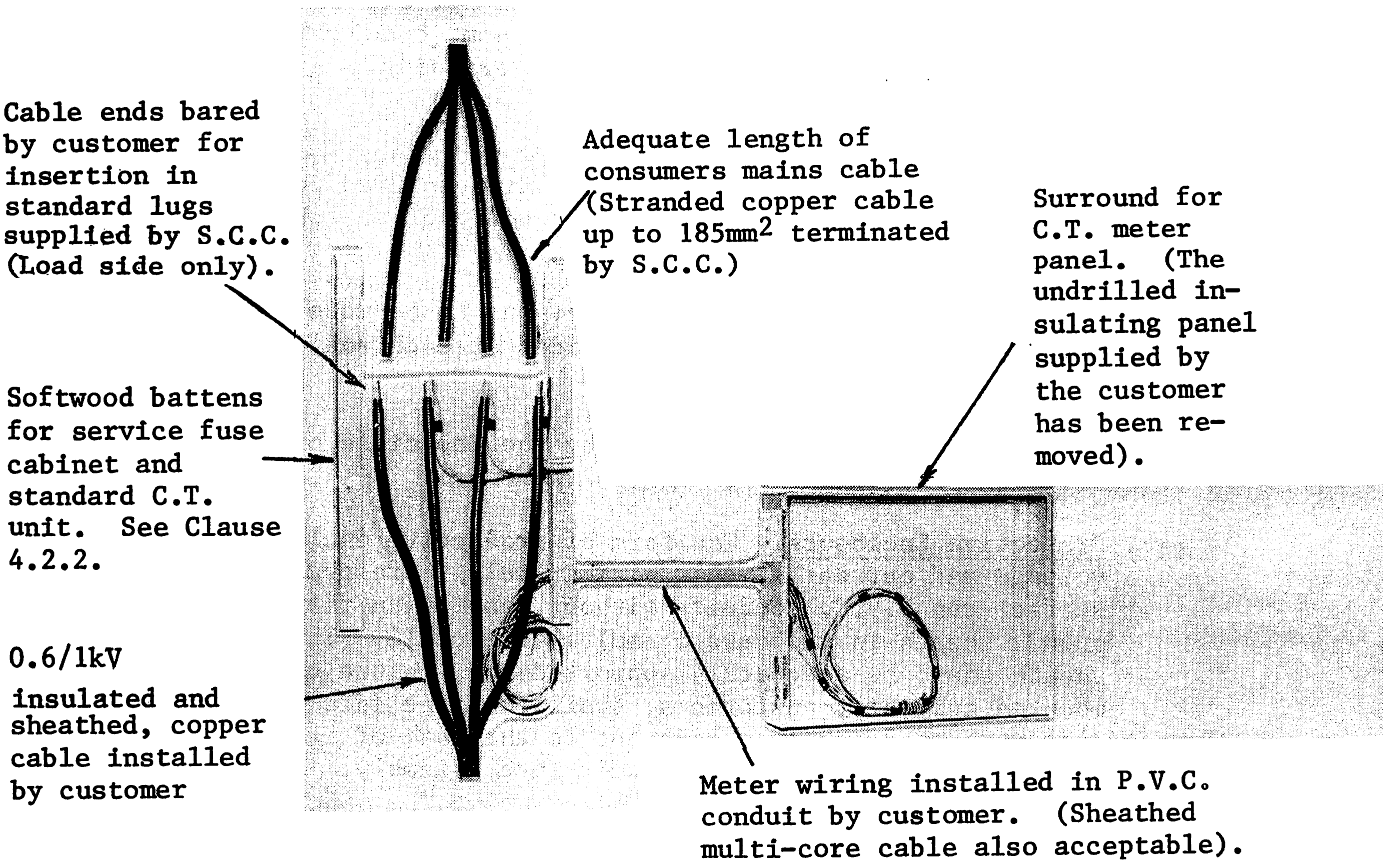

Cable ends bared by customer for insertion in standard lugs supplied by S.C.C. (Load side only).
Adequate length of consumers mains cable (Stranded copper cable up to 185mm^2 terminated by S.C.C.)
Surround for C.T. meter panel. (The undrilled insulating panel supplied by the customer has been removed).
Softwood battens for service fuse cabinet and standard C.T. unit. See Clause 4.2.2.
0.6/1kV insulated and sheathed, copper cable installed by customer
Meter wiring installed in P.V.C. conduit by customer. (Sheathed multi-core cable also acceptable).

ILLUSTRATION 4. TYPICAL PROVISIONS TO BE MADE BY THE CUSTOMER FOR C.T. METERING. (See Drawings Reference Nos. E.I. 110 and 112).

5. FACILITIES REQUIRED FOR THE CONNECTION OF METERING EQUIPMENT

5.1 GENERAL. Drawing Reference No. E.I. 114 shows a typical wiring diagram for C.T. metering. The customer shall provide and install all wiring necessary between the current-transformer position and the meter position for each separately metered portion of the installation and, where summation equipment is installed, all wiring between meter panels. The wiring shall be 0.6/1kV, plastic.-insulated, stranded copper cable installed in accordance with the SAA Wiring Rules and the following requirements:-

i) Size and Number of Conductors

Voltage circuit	2.5 or 4mm^2	4 per C.T.-metered portion (includes a neutral)
Current circuit	4, 6 or 10mm^2 per Table 2.	4 per C.T.-metered portion.
Earthing	2.5 or 4mm^2	1 per C.T.-metered portion.
Summation equipment	1.5mm^2	5 per remote metering point.

No joints are permitted in these conductors.

ii) Visual Identification

Each of the insulated conductors shall be visually distinguishable by size, colour and/or symbol on the insulation at intervals along its length.

The conductors in the above tabulation may comprise the following:-

(a) Single insulated conductors enclosed in conduit; or

(b) Two multi-core cables, having different size conductors, one for the voltage circuit and earthing, and the other for the current circuit; or

(c) Where $4mm^2$ conductors are adequate for the current circuit, a single multi-core cable having $4mm^2$ conductors for both voltage and current circuits and earthing.

No wiring for purposes other than that described in 5.2, to 5.6 inclusive shall be contained in the conduit or sheath protecting this wiring.

Sufficient length to enable connections to be made by the Council's officer (1.5m min.) shall be provided at each end unless otherwise specified on the Notice.

Except where otherwise approved by the Council's officer, the conduit or cable(s) shall be open to view.

iii) Protective Enclosure. The form of protective enclosure for the voltage and current-circuit wiring shall, where practicable, be surface-run P.V.C. conduit without inspection fittings, or the plastic sheath in the case of multi-core cable. The conduit or sheath shall be adequately supported and, in the case of switchboard-mounted current transformers, shall continue into the switchboard enclosure to a position adjacent to the base of each current transformer and to the voltage-circuit fuse assembly.

Where surface-run wiring is not practicable, the wiring shall be in heavy-duty U.P.V.C. conduit laid at a depth of 450mm except where the conduit is encased in concrete.

5.2 CURRENT-CIRCUIT WIRING. The cross-sectional area required for the C.T. secondary circuit conductors is dependent upon the route length of the wiring between the meter panel and the current transformers and on the transformer characteristics. It shall be not less than that shown in Table 2.

TABLE 2

MAXIMUM ROUTE LENGTH OF CURRENT CIRCUIT WIRING (m)		CONDUCTOR CROSS-SECTIONAL AREA mm^2
*MAXIMUM DEMANDS UP TO & INCLUDING 400A	*MAXIMUM DEMANDS IN EXCESS OF 400A	
12	48	4
18	72	6
30	100	10

* The maximum demand shall be assessed in accordance with SAA Wiring Rule 2.4 unless advice to the contrary is given by the Council's officer.

5.3 VOLTAGE-CIRCUIT WIRING. Where the standard C.T. unit is used, the Council will supply and install the wiring between the terminals on the line side of the C.T.'s and the voltage circuit fuse assembly. In all other cases, the customer shall install:-

- A 2.5 or 4mm^2 sheathed cable from each primary conductor to the voltage-circuit fuse assembly. Each cable shall be visually identifiable with the associated current transformer.

  The connection to the primary conductor shall be made on the line side and close to each current transformer. However, where the tariff involves supply being provided during specified hours and the switch controlling supply to the portion of the installation being metered is on the line side of the current transformers, this connection must be located on the line side of the switch and close to it.

  The cables shall be of minimum length, adequately supported and protected against mechanical damage. Sufficient cable shall be provided for convenient termination in the voltage-circuit fuse assembly.

- A connection facility for the metering neutral conductor in an accessible location in close proximity to the current transformer position. The facility may be a suitable tunnel terminal or set screw in an approved neutral bar which may be the neutral conductor for the whole installation or for the portion of the installation being metered. Alternatively, it may be in the form of a suitable neutral link installed on the same panel as the voltage-circuit fuse assembly and connected by means of 2.5mm^2 (min.) cable to an approved neutral conductor as described below.

The connection to a busbar shall be by means of a suitable lug secured by a 6mm dia. set screw into a tapped hole and be clearly visible from the position of the current transformers. Any alternative proposal for the means of connection of voltage-circuit wiring and metering neutral conductors as above shall be submitted in writing for approval.

Separate sealing facilities must be provided for these connections if they are not contained within a sealed portion of the switchboard.

5.4 WIRING BETWEEN LOAD CONTROL DEVICE AND CONTACTOR

If the customer provides a contactor in accordance with Section 6 below, he shall install a pair of 2.5mm^2 cables between the C.T. metering panel and the contactor. This wiring shall comply with the requirements of Clause 5.1 and be controlled and protected by a suitable switch and 10A H.R.C. fuse, both of which have provision for sealing.

This pair of cables may be grouped with the other metering cables provided they are visually distinguishable from them.

5.5 EARTHING CONNECTION. The customer shall also install a 2.5 or 4mm^2 stranded copper earthing conductor in accordance with the provisions of SAA Wiring Rule 5.3.2 and connect it to an earthing terminal inside the metal surround of the meter panel and also provide additional length of 1.5m.

5.6 SUMMATION-EQUIPMENT WIRING. In certain circumstances where the customer takes supply at Demand Tariff, the Council is prepared to summate the demands registered at different supply points. Where this is agreed to, the customer is required to provide wiring consisting of five 1.5mm^2 (min.) visually distinguishable cores, generally in accordance with Clause 5.1, between the locations where metering equipment is installed.

6. CONTROLLED LOAD

Where, in accordance with the provisions of a tariff, electricity is to be supplied to a C.T.-metered portion of an installation only during certain hours, the customer shall supply and install a contactor arranged so that it is operated by the Council's control device. The contactor shall be of a type approved by the Council having the terminals and mechanism enclosed in a manner which facilitates sealing. It shall have a 240 volt operating coil and be designed to close and open simultaneously with the Council's control device.

The contactor shall be installed at the meter position or, alternatively, adjacent to the controlled-load current transformers. A typical wiring diagram of a C.T.-metering installation including a controlled-load contactor is shown on Drawing Reference No. E.I. 114 attached.

7. DRAWINGS

The following drawings form part of this publication:-

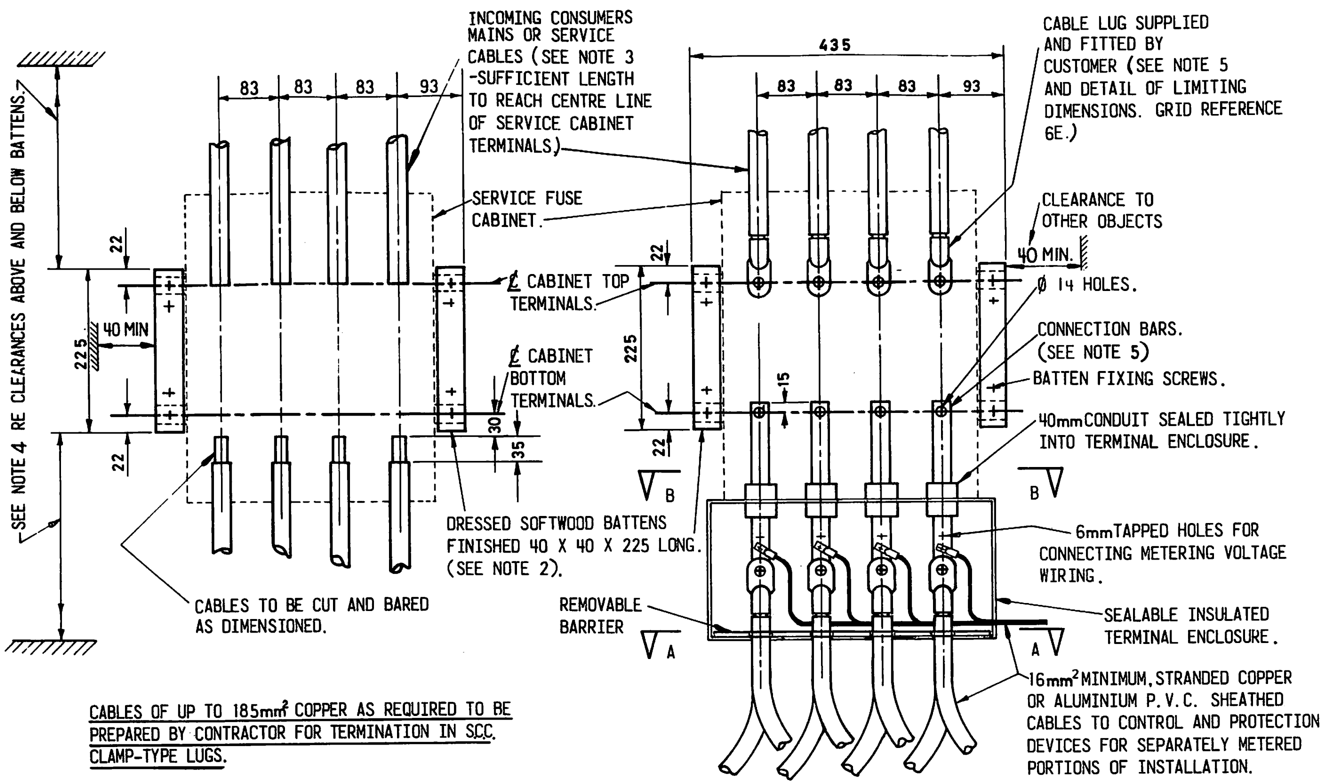
Reference No. E.I. 110,	"SERVICE FUSE CABINET, 200-400A, CONSUMERS MAINS TERMINATIONS".
Reference No. E.I. 111,	"METERING CURRENT TRANSFORMERS, PRINCIPAL DIMENSIONS".
Reference No. E.I. 112,	"STANDARD C.T. UNIT".
Reference No. E.I. 113,	"METERING C.T. INSTALLATION IN SWITCHBOARDS, GENERAL REQUIREMENTS".
Reference No. E.I. 114,	"C.T. METERING, TYPICAL WIRING DIAGRAM INCLUDING PROVISION FOR CONTROLLED LOAD".

8. FURTHER INFORMATION

Where it is proposed to incorporate the Council's metering current transformers within a customer's switchboard, contact should be made by the switchboard manufacturer with the Customer Supply and Services office for the Area in which it is to be installed so that the proposed arrangements may be discussed. Information on other provisions to be made by the customer is contained in publication E.I. 8, "Provisions for Service Equipment in Multiple Installations".

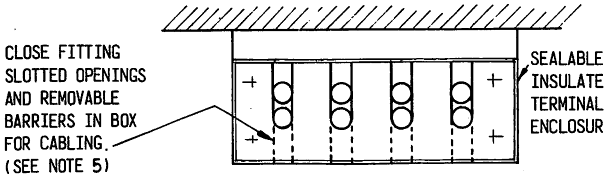
9. ISSUE DATE

This publication dated September, 1983, supersedes that of the same number issued in April, 1980.

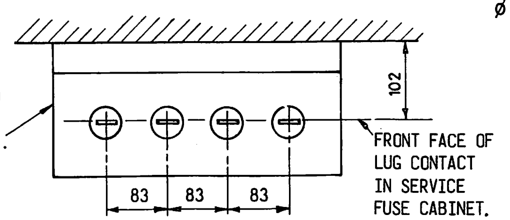

SEE NOTE 4 RE CLEARANCES ABOVE AND BELOW BATTENS.
INCOMING CONSUMERS MAINS OR SERVICE CABLES (SEE NOTE 3 -SUFFICIENT LENGTH TO REACH CENTRE LINE OF SERVICE CABINET TERMINALS.)
83
83
83
93
435
22
225
40 MIN
22
SERVICE FUSE CABINET.
℄ CABINET TOP TERMINALS.
℄ CABINET BOTTOM TERMINALS.
30
35
22
225
15
22
B
DRESSED SOFTWOOD BATTENS FINISHED 40 X 40 X 225 LONG. (SEE NOTE 2).
CABLES TO BE CUT AND BARED AS DIMENSIONED.
REMOVABLE BARRIER
A
CABLE LUG SUPPLIED AND FITTED BY CUSTOMER (SEE NOTE 5 AND DETAIL OF LIMITING DIMENSIONS. GRID REFERENCE 6E.)
CLEARANCE TO OTHER OBJECTS
40 MIN.
Ø 14 HOLES.
CONNECTION BARS. (SEE NOTE 5)
BATTEN FIXING SCREWS.
40mm CONDUIT SEALED TIGHTLY INTO TERMINAL ENCLOSURE.
B
6mm TAPPED HOLES FOR CONNECTING METERING VOLTAGE WIRING.
SEALABLE INSULATED TERMINAL ENCLOSURE.
A
16mm² MINIMUM, STRANDED COPPER OR ALUMINIUM P.V.C. SHEATHED CABLES TO CONTROL AND PROTECTION DEVICES FOR SEPARATELY METERED PORTIONS OF INSTALLATION.

CABLES OF UP TO 185mm² COPPER AS REQUIRED TO BE PREPARED BY CONTRACTOR FOR TERMINATION IN SCC. CLAMP-TYPE LUGS.

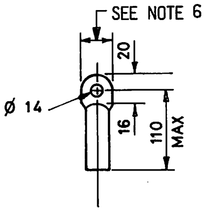
FACILITIES FOR TERMINATING CABLES WHICH ARE NOT SUITABLE FOR TERMINATION USING THE SCC. CLAMP-TYPE LUG.


CLOSE FITTING SLOTTED OPENINGS AND REMOVABLE BARRIERS IN BOX FOR CABLING. (SEE NOTE 5)
SEALABLE INSULATED TERMINAL ENCLOSURE.

SECTION AA


102
FRONT FACE OF LUG CONTACT IN SERVICE FUSE CABINET.
83
83
83

SECTION BB


SEE NOTE 6
20
Ø 14
16
110 MAX

LIMITING DIMENSIONS OF CUSTOMER'S LUG IN SERVICE FUSE CABINET.

REFERENCE DRAWING.

STANDARD C.T. UNIT (E.I. 112) A2-58053

NOTES

1. GENERAL. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH E.I. 8, "PROVISIONS FOR SERVICE EQUIPMENT IN MULTIPLE INSTALLATIONS" AND , WHERE CURRENT TRANSFORMERS ARE TO BE INSTALLED ADJACENT TO THE SERVICE CABINET, PUBLICATION E.I.18, "CURRENT TRANSFORMER METERING" AND DRAWING REFERENCE NO. E.I.112 ,"STANDARD C.T. UNIT."

2. MOUNTING OF SERVICE FUSE CABINET. THE CUSTOMER IS REQUIRED. TO ERECT BATTENS IN A POSITION AS NOMINATED BY THE COUNCIL'S OFFICER. (SEE CLAUSE 5.1 , PUBLICATION E.I. 18 WHERE THE STANDARD C.T. UNIT IS ALSO REQUIRED).

3. CABLE ENTRY. INCOMING CONSUMERS MAINS OR SERVICE CABLES MAY ENTER THE SERVICE FUSE CABINET FROM EITHER THE TOP OR BOTTOM.

4. CLEARANCES FOR CONSUMER MAINS. THE MINIMUM CLEARANCES REQUIRED FOR CABLES ENTERING THE SERVICE FUSE CABINET AND MEASURED FROM THE END OF BATTENS TO ANY FIXED OBJECT AS ILLUSTRATED IN THIS DRAWING SHALL BE AS FOLLOWS:—

SIZE AND TYPE OF CABLE.	CLEARANCE. (mm)
LESS THAN 185mm²	550
185mm² TO 300mm² SINGLE CORE	700
185mm² TO 300mm² MULTI-CORE	1000

5. CONSUMERS MAINS TERMINATIONS. WHERE CABLES ARE NOT SUITABLE FOR TERMINATION IN THE CABINET USING THE S.C.C. CLAMP-TYPE LUG. THE CUSTOMER SHALL PROVIDE AN APPROVED CONNECTING FACILITY FITTED READY FOR CONNECTION TO THE SERVICE CABINET TERMINALS. (SEE CLAUSE 4.4.3 PUBLICATION E.I.8 AND CLAUSES 5.2 AND 5.3 OF PUBLICATION E.I. 18). THE DRAWING SHOWS REQUIREMENTS FOR LUGS AND CONNECTING BARS.

6. LUGS SUPPLIED BY CUSTOMER. THE CONTACT SURFACE OF THE LUG SHALL BE A MAXIMUM OF 40mm IN WIDTH AND BE FINISHED TO A MEDIUM COMMERCIAL MACHINED FINISH.

AMENDMENT

1. REF. CG. NEW NOTE 3 ADDED. NOTES 4 TO 6 WERE 3,4 & 5 H.E.B. 29-3-84 CHECKED: A.S.K. P.N. 20680

2. NOTES 1,2 & 5 ALTERED TO SUIT REQUIREMENTS OF E.E.-E.I. P.N. 22160 H.E.B. 23-6-86 CHECKED: M.R.

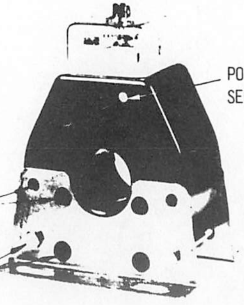
THE
SYDNEY
COUNTY
COUNCIL

UNLESS OTHERWISE STATED ALL DIMENSIONS ARE IN MILLIMETRES

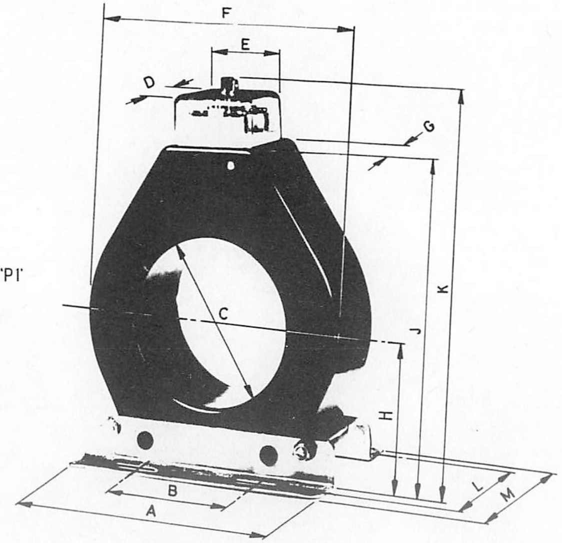
SERVICE FUSE CABINET 200-400A
CONSUMERS MAINS
TERMINATIONS

REFERENCE NUMBER
E.I. 110

SIZE	NUMBER	AMD.
A2	56706	2



TYPE "S" 200/5 EXTENDED RANGE



TYPE "T" 800/5 EXTENDED RANGE
TYPE "U" 2000/5 EXTENDED RANGE

REFERENCE DRAWING

METERING C. T. INSTALLATION IN SWITCHBOARD
GENERAL REQUIREMENTS (E. I. 113.) A2-58055

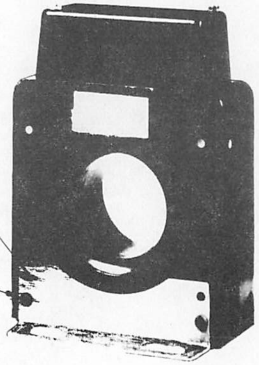
NOTES

1: GENERAL. BEFORE PROCEEDING WITH THE MANUFACTURE OR DESIGN OF ANY SWITCHBOARD ASSEMBLY REQUIRING THE USE OF METERING CURRENT TRANSFORMERS, REFERENCE SHOULD BE MADE TO PUBLICATION E. I. 18 " CURRENT TRANSFORMER METERING ".

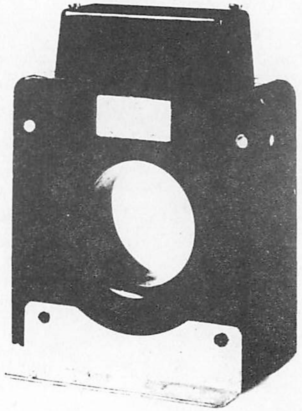
2 MOUNTING. TYPES "A" AND "S" CURRENT TRANSFORMERS MAY BE ASSEMBLED TO PROVIDE ALTERNATIVE HEIGHTS "H1" AND "H2" BETWEEN THE MOUNTING SURFACE AND THE CENTRE LINE OF THE C. T. OPENING (DIMENSION "C"). MAXIMUM HEIGHT "H2" POSITION MUST BE USED IF BUSBARS PASS THROUGH THE OPENING.

3 POLARITY. EACH CURRENT TRANSFORMER IS PROVIDED WITH POLARITY MARKS. THE TRANSFORMER SHALL BE INSTALLED WITH THE POLARITY MARK "P1" FACING THE DIRECTION OF THE INCOMING SUPPLY.

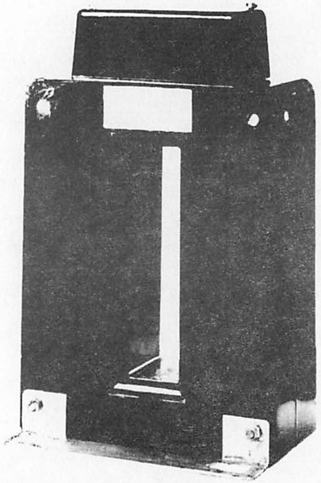
DIMENSIONS	TYPE 'A'	TYPE 'B'	TYPE 'C'	TYPE 'S'	TYPE 'T'	TYPE 'U'
A	125	140	156	126	160	240
B-MOUNTING HOLE CENTRES	76	76	114	74	75	190
C	DIA 60	DIA 73	WIDTH 35 HEIGHT 137	DIA 35	DIA 96	DIA 170
D	49	49	49	49	49	45
E	112	112	112	54	54	50
F	140	165	162	109	162	256
G	54	54	70	52	54	57
H SEE NOTE 2	H1-73 H2-86	86	106	H1-54 H2-86	85	128
J SEE NOTE 2	J1-145 J2-158	170	212	J1-113 J2-145	186	273
K SEE NOTE 2	K1-190 K2-203	215	264	K1-151 K2-183	224	316
L-MOUNTING HOLE CENTRES	79	79	95	80	80	127
M	106	113	122	106	107	160
WIDTH OF MOUNTING SLOT	10	10	10	10	10	10



TYPE "A" 150/300/600/5



TYPE "B" 400/800/1200/5



TYPE "C" 1000/2000/3000/5

AMENDMENT

1. C.T. Ratios added adjacent to types Note 2. "H2" was 'H1'. H.E.B. 8-3-83 P.N. 20/30 Chk: B.J.T.

2. Ref C2 & C4 Extended Range added. H.E.B. 28-7-83 P.N. 20/30 Chk. A.S.R

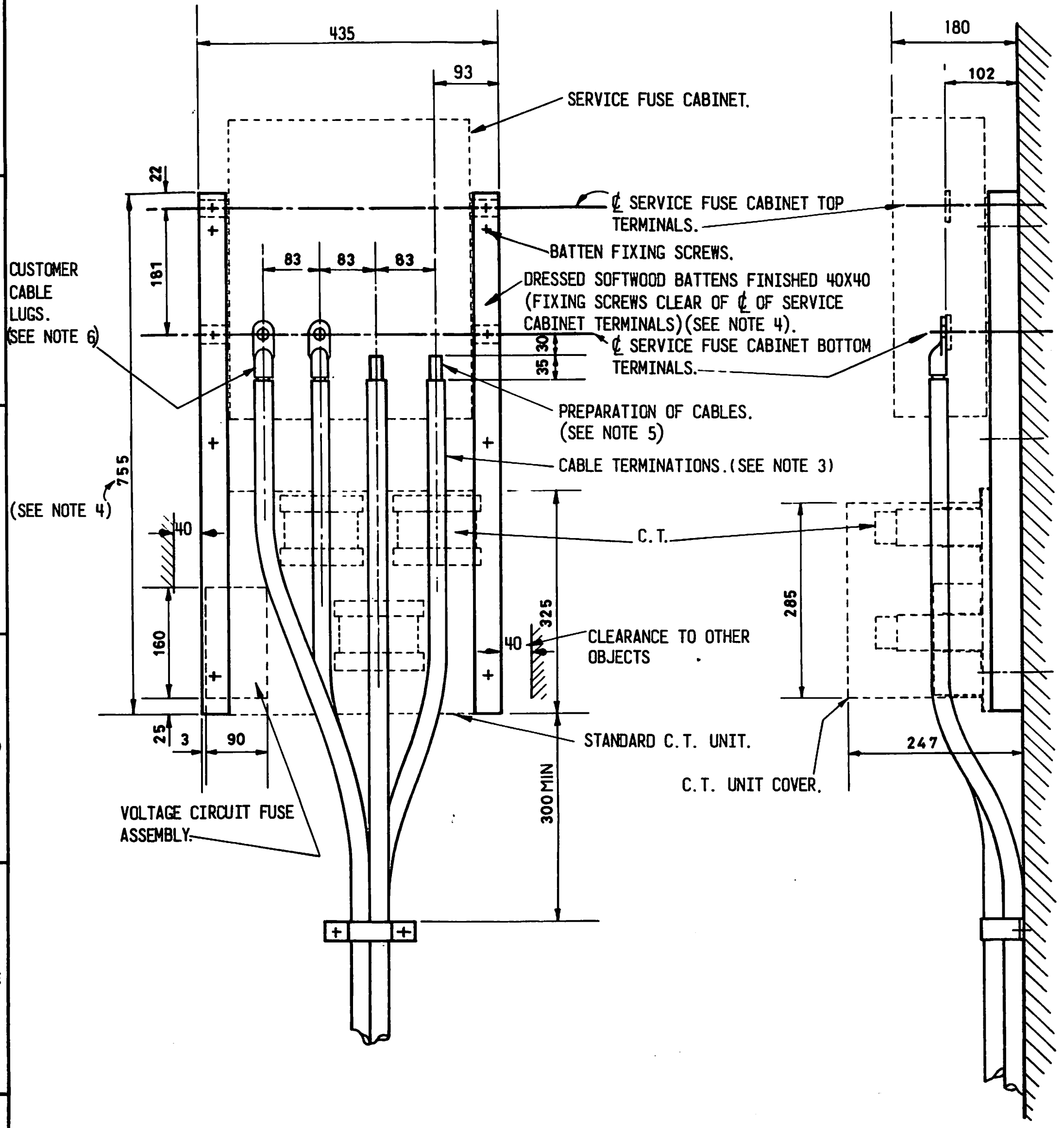
3. Ref C3, D8. Type 'U', table added & note at C.T. added. Note 1 altered to suit requirements of E.E.-E.I. P.N. 22/60 H.E.B. 24-6-86 Checked: M.P.

THE
SYDNEY
COUNTY
COUNCIL

UNLESS OTHERWISE
STATED ALL DIMENSIONS
ARE IN MILLIMETRES

METERING CURRENT TRANSFORMERS
PRINCIPAL DIMENSIONS

REFERENCE NUMBER		
E.I. 111		
SIZE	NUMBER	AMD.
A2	57186	3


435
93
SERVICE FUSE CABINET.
22
181
℄ SERVICE FUSE CABINET TOP TERMINALS.
BATTEN FIXING SCREWS.
83
83
83
CUSTOMER CABLE LUGS. (SEE NOTE 6)
DRESSED SOFTWOOD BATTENS FINISHED 40X40 (FIXING SCREWS CLEAR OF ℄ OF SERVICE CABINET TERMINALS)(SEE NOTE 4).
℄ SERVICE FUSE CABINET BOTTOM TERMINALS.
30
35
PREPARATION OF CABLES. (SEE NOTE 5)
CABLE TERMINATIONS.(SEE NOTE 3)
755
(SEE NOTE 4)
40
C.T.
160
325
40
CLEARANCE TO OTHER OBJECTS
25
3
90
STANDARD C.T. UNIT.
300 MIN
VOLTAGE CIRCUIT FUSE ASSEMBLY.
180
102
285
247
C.T. UNIT COVER.

REFERENCE DRAWINGS.

SERVICE FUSE CABINET 200-400A CONSUMERS MAINS TERMINATIONS.(E.I. 110)	A2-56706
C.T. METERING TYPICAL WIRING DIAGRAM INCLUDING PROVISIONS FOR CONTROLLED LOAD.(E.I. 114).	A2-58054

NOTES.

1. GENERAL. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH PUBLICATION E.I.18, 'CURRENT TRANSFORMER METERING' REFERENCES IN THESE NOTES ARE TO THE RELEVANT CLAUSES OF THIS PUBLICATION.
2. STANDARD C.T. UNIT. THIS IS DESIGNED FOR WALL MOUNTING ABOVE OR BELOW A 200-400A SERVICE FUSE CABINET. WHEN THE UNIT IS INSTALLED ABOVE THE SERVICE CABINET, THE LAYOUT OF EQUIPMENT OF THE UNIT AND THE SPACING BETWEEN THE UNIT AND SERVICE CABINET WILL REMAIN AS DRAWN.
3. TERMINATION OF CABLES AND CONDUCTORS PASSING THROUGH C.T.'S. FOR THE TERMINATION OF CABLES ON THE LOAD SIDE OF THE SERVICE CABINET AND THE PROVISION OF CONNECTION BARS AND TERMINALS, SEE CLAUSES 5.2, 5.3 AND TABLE 1 (ALSO DRAWING REFERENCE NO. E.I. 110).
4. MOUNTING. THE CUSTOMER IS REQUIRED TO ERECT BATTENS IN A POSITION NOMINATED BY THE COUNCIL'S OFFICER. (SEE CLAUSE 5.1)
5. CABLE PREPARATION. THE INSULATION ON STRANDED COPPER PRIMARY CONDUCTORS UP TO AND INCLUDING 185mm² IS TO BE BARED 35mm READY FOR INSERTION INTO S.C.C. CLAMP TYPE LUGS IN THE SERVICE CABINET. (SEE ALSO DRAWING REFERENCE NO. E.I. 110).
6. PROVISION OF CABLE LUGS. CABLES EXCEEDING 185mm² TERMINATING IN THE SERVICE CABINET SHALL BE FITTED WITH SUITABLE LUGS PROVIDED BY THE CUSTOMER. SEE DRAWING REFERENCE NO. E.I. 110 FOR THE LIMITING DIMENSIONS OF THESE LUGS. THE CENTRE LINE OF THE BOLT HOLES OF LUGS SHALL CORRESPOND WITH THE CENTRE LINES OF THE SERVICE CABINET TERMINALS AS ILLUSTRATED. WHERE THE CABLES PASSING THROUGH THE CURRENT TRANSFORMERS ARE TERMINATED OTHER THAN IN A SERVICE CABINET, SEE SECTION 5 (ALSO DRAWING REFERENCE NO. E.I. 110).
7. WIRING. REQUIREMENTS FOR METERING WIRING WHICH THE CUSTOMER IS REQUIRED TO PROVIDE BETWEEN THE STANDARD C.T. UNIT AND THE METERING PANEL, ARE OUTLINED IN SECTION 7. A TYPICAL WIRING DIAGRAM, INCLUDING PROVISION FOR CONTROLLED LOAD, IS SHOWN IN DRAWING REFERENCE NO. E.I. 114.

AMENDMENT

1. Ref. C1-D3, 40mm dimension added. Notes 1,3,4,6&7 altered to suit requirements of E.E.-E.I. A/C P.N. 22160 H.E.B. 29-6-86 Checked: M.P.

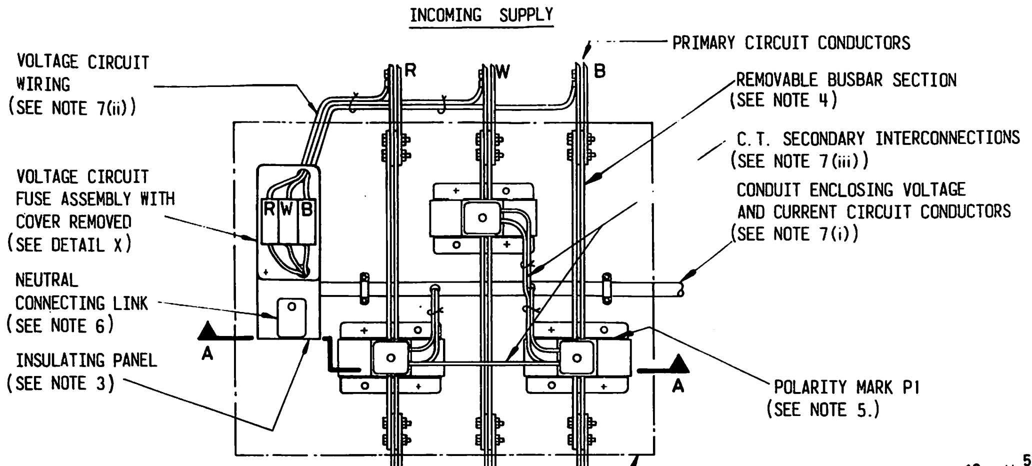
THE
SYDNEY
COUNTY
COUNCIL

UNLESS OTHERWISE
STATED ALL DIMENSIONS
ARE IN MILLIMETRES

STANDARD C.T. UNIT

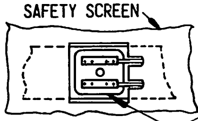
REFERENCE NUMBER
E.I. 112

SIZE	NUMBER	AMD.
A2	58053	1


INCOMING SUPPLY
PRIMARY CIRCUIT CONDUCTORS
R
W
B
VOLTAGE CIRCUIT WIRING (SEE NOTE 7(ii))
REMOVABLE BUSBAR SECTION (SEE NOTE 4)
C.T. SECONDARY INTERCONNECTIONS (SEE NOTE 7(iii))
VOLTAGE CIRCUIT FUSE ASSEMBLY WITH COVER REMOVED (SEE DETAIL X)
CONDUIT ENCLOSING VOLTAGE AND CURRENT CIRCUIT CONDUCTORS (SEE NOTE 7(i))
R W B
NEUTRAL CONNECTING LINK (SEE NOTE 6)
INSULATING PANEL (SEE NOTE 3)
A
A
POLARITY MARK P1 (SEE NOTE 5.)
SAFETY SCREEN (TYPICAL LOCATION)

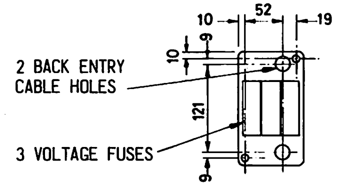
FRONT VIEW

(TYPICAL ARRANGEMENT WITH SCREEN REMOVED FOR CLARITY.)


SAFETY SCREEN
C.T. TERMINAL BLOCK

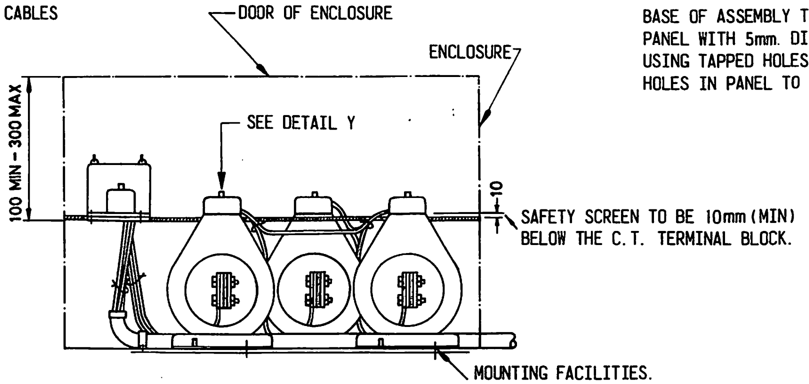
DETAIL Y

TYPICAL APERTURES IN SAFETY SCREEN FOR CT. AND CABLES


10
52
19
10
9
121
9
2 BACK ENTRY CABLE HOLES
3 VOLTAGE FUSES

DETAIL X

BASE OF ASSEMBLY TO BE FIXED TO PANEL WITH 5mm. DIA CSK. SCREWS USING TAPPED HOLES. CABLING HOLES IN PANEL TO BE 22mm. DIA.


DOOR OF ENCLOSURE
ENCLOSURE
SEE DETAIL Y
100 MIN - 300 MAX
10
SAFETY SCREEN TO BE 10mm (MIN) BELOW THE C.T. TERMINAL BLOCK.
MOUNTING FACILITIES. (SEE NOTE 3.)

SECTION AA

REFERENCE DRAWINGS

METERING CURRENT TRANSFORMERS PRINCIPAL DIMENSIONS (E.I. 111)	A2-57186
C.T. METERING TYPICAL WIRING DIAGRAM INCLUDING PROVISION FOR CONTROLLED LOAD (E.I. 114)	A2-58054

NOTES

1. GENERAL. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH PUBLICATION E.I. 18 "CURRENT TRANSFORMER METERING". REFERENCES IN THESE NOTES ARE TO THE RELEVANT CLAUSES OF THIS PUBLICATION.
   THE DRAWING ILLUSTRATES A TYPICAL ARRANGEMENT OF EQUIPMENT SHOWING HOW THE REQUIREMENTS MAY BE MET. ARRANGEMENTS MAY BE VARIED WITHIN THE SCOPE PERMITTED IN PUBLICATION E.I. 18.
   A TYPICAL WIRING DIAGRAM INCLUDING PROVISION FOR CONTROLLED LOAD IS SHOWN IN DRAWING NO. E.I. 114.
2. LOCATION AND ACCESS REQUIREMENTS. REFERENCE SHOULD BE MADE TO CLAUSE 6.1.
3. MOUNTINGS. THE MOUNTING FACILITIES REQUIRED FOR CURRENT TRANSFORMERS, THE VOLTAGE CIRCUIT FUSE ASSEMBLY AND A SEALABLE METERING NEUTRAL LINK IF REQUIRED ARE SET OUT IN CLAUSE 6.7 THE COUNCIL SUPPLIES THE CURRENT TRANSFORMERS AND VOLTAGE CIRCUIT FUSE ASSEMBLY FOR INSTALLATION BY THE CUSTOMER'S CONTRACTOR.
4. CONDUCTORS PASSING THROUGH C.T.'S. THE RELEVANT REQUIREMENTS FOR THE INSTALLATION OF PRIMARY CIRCUIT CONDUCTORS EITHER AS CABLES OR BUSBARS ARE COVERED IN SECTION 6.
5. CURRENT-TRANSFORMERS POLARITY. EACH CURRENT TRANSFORMER IS PROVIDED WITH POLARITY MARKS. THE TRANSFORMERS SHALL BE INSTALLED WITH THE POLARITY MARK P1 FACING THE DIRECTION OF THE INCOMING SUPPLY.
6. METERING NEUTRAL LINK. WHERE REQUIRED BY CLAUSE 7.5, THE CUSTOMER SHALL PROVIDE AND FIX ON THE PANEL SUPPORTING THE VOLTAGE CIRCUIT FUSE ASSEMBLY (SEE CLAUSE 6.7), A SEALABLE METERING NEUTRAL LINK.
7. WIRING
   i) GENERAL. ALL WIRING FOR METERING PURPOSES SHALL BE INSTALLED BY THE CONTRACTOR IN ACCORDANCE WITH SECTION 7 OF E.I. 18. UNDER NORMAL CIRCUMSTANCES, THE SWITCHBOARD WILL NOT BE ENERGISED UNTIL COMPLETION OF THE METERING INSTALLATION AND ONLY COUNCIL STAFF WILL INSERT METERING CABLES IN THE TERMINALS OF ITS EQUIPMENT. HOWEVER, WHERE THE COUNCIL'S OFFICER AGREES THAT IT IS NECESSARY FOR THE PRIMARY CIRCUIT CONDUCTORS TO BE ENERGISED PRIOR TO COMPLETION BY THE COUNCIL OF THE METERING INSTALLATION, THE CONTRACTOR WILL BE REQUIRED TO TERMINATE THE WIRING DESCRIBED IN 7 (ii) IN THE VOLTAGE CIRCUIT FUSE TERMINALS.
   ii) WIRING BETWEEN VOLTAGE-CIRCUIT FUSES AND PRIMARY-CIRCUIT CONDUCTORS. THREE 2.5 OR 4mm² INSULATED AND SHEATHED CABLES WHICH ARE VISUALLY DISTINGUISHABLE FROM EACH OTHER AND ADEQUATELY SUPPORTED ARE REQUIRED. THIS REQUIREMENT MAY BE MET BY USING P.V.C. INSULATED CABLE ENCLOSED IN 6mm DIA. CLEAR P.V.C. TUBING WITH A WALL THICKNESS OF 1.5mm. A CLEARANCE OF 25mm (MIN) SHALL BE MAINTAINED FROM BUSBARS.
   iii) CURRENT-CIRCUIT WIRING. THESE CABLES SHALL BE SUPPORTED BETWEEN THE CONDUIT AND TERMINAL BLOCKS BY TYING THEM TOGETHER OR EQUIVALENT MEANS AND SHALL BE BROUGHT OUT THROUGH THE APERTURES IN THE SAFETY SCREEN LEAVING SUFFICIENT LENGTH FOR COUNCIL STAFF TO TERMINATE THEM.
   THE 2 SHORT C.T. SECONDARY INTERCONNECTIONS REQUIRED SHALL BE 2.5mm² S.C. P.V.C. INSULATED AND SHEATHED CABLE.

AMENDMENT

1. Ref. A9. 'W' phase colour was 'Y'. H.E.B. 8-3-83 RN. 20150 Chk: BJT

2. Ref. C6, D6, D7 & E6 Hyphens adde H.E.B. 28-7-83 RN 20150 Chk: A.S.K

3. Notes 1-4, 6, 7 altered to suit requirements of EE-EI. O/C RN. 22160. H.E.G. 23-6-86 Checked: M.P.

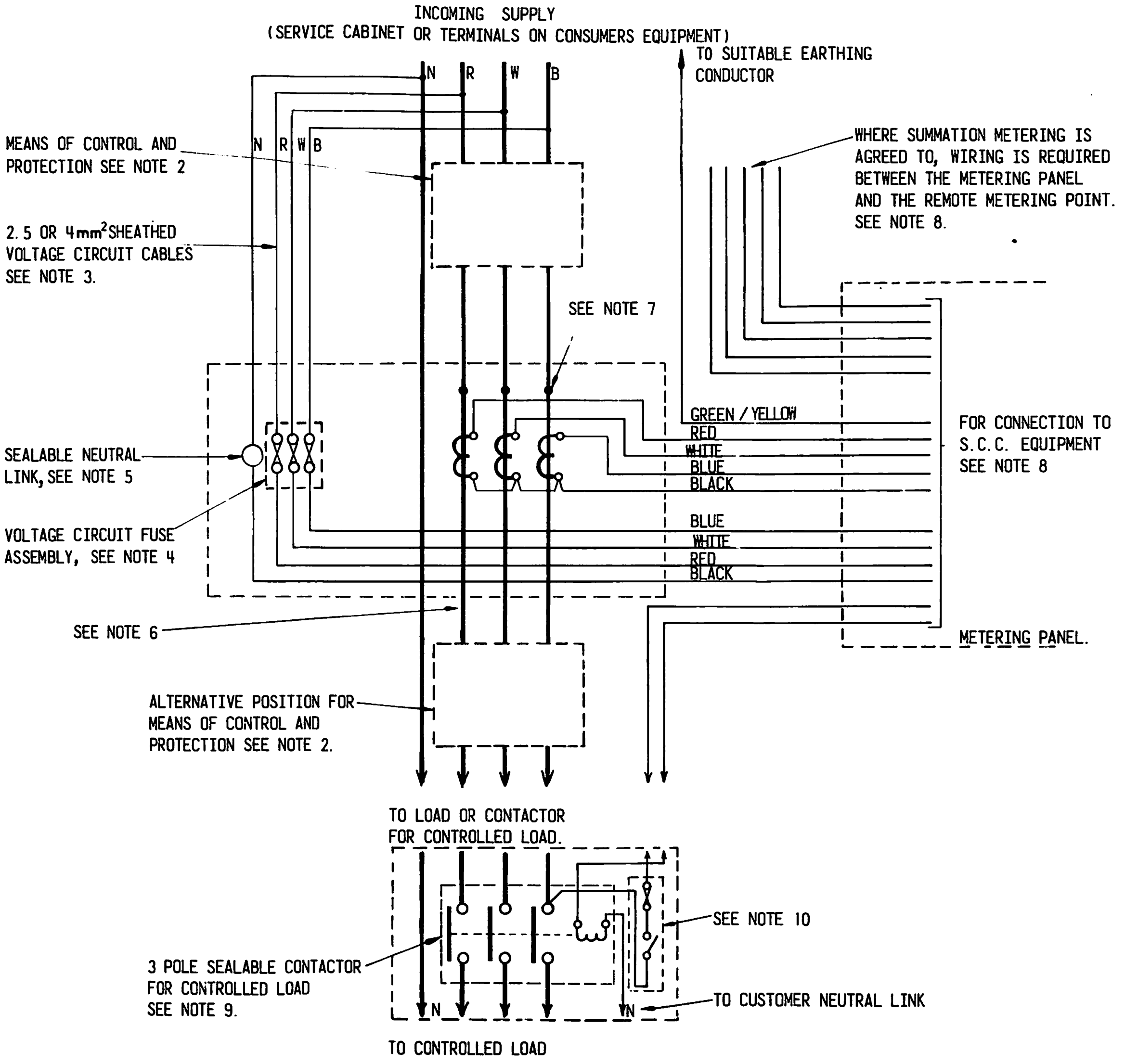
THE
SYDNEY
COUNTY
COUNCIL

UNLESS OTHERWISE STATED ALL DIMENSIONS ARE IN MILLIMETRES

METERING C.T. INSTALLATION IN SWITCHBOARDS GENERAL REQUIREMENTS

REFERENCE NUMBER
E.I. 113

SIZE	NUMBER	AMD.
A2	58055	3


INCOMING SUPPLY
(SERVICE CABINET OR TERMINALS ON CONSUMERS EQUIPMENT)
N
R
W
B
TO SUITABLE EARTHING CONDUCTOR
MEANS OF CONTROL AND PROTECTION SEE NOTE 2
N
R
W
B
WHERE SUMMATION METERING IS AGREED TO, WIRING IS REQUIRED BETWEEN THE METERING PANEL AND THE REMOTE METERING POINT. SEE NOTE 8.
2.5 OR 4mm² SHEATHED VOLTAGE CIRCUIT CABLES SEE NOTE 3.
SEE NOTE 7
SEALABLE NEUTRAL LINK, SEE NOTE 5
GREEN / YELLOW
RED
WHITE
BLUE
BLACK
FOR CONNECTION TO S.C.C. EQUIPMENT SEE NOTE 8
VOLTAGE CIRCUIT FUSE ASSEMBLY, SEE NOTE 4
BLUE
WHITE
RED
BLACK
SEE NOTE 6
METERING PANEL.
ALTERNATIVE POSITION FOR MEANS OF CONTROL AND PROTECTION SEE NOTE 2.
TO LOAD OR CONTACTOR FOR CONTROLLED LOAD.
SEE NOTE 10
3 POLE SEALABLE CONTACTOR FOR CONTROLLED LOAD SEE NOTE 9.
N
N
TO CUSTOMER NEUTRAL LINK
TO CONTROLLED LOAD

REFERENCE DRAWINGS

SERVICE FUSE CABINET 200-400A CONSUMERS MAINS TERMINATIONS (E.I. 110)	A2-56706
METERING CURRENT TRANSFORMERS-PRINCIPAL DIMENSIONS (E.I. 111)	A2-57186
STANDARD C.T. METERING UNIT (E.I. 112)	A2-58053
METERING C.T. INSTALLATION IN SWITCHBOARDS, GENERAL REQUIREMENTS (E.I. 113)	A2-58055

NOTES

1. GENERAL. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH PUBLICATION E.I. 18 'METERING WHICH REQUIRES THE USE OF CURRENT TRANSFORMERS'. REFERENCES IN THESE NOTES ARE TO THE RELEVANT CLAUSES OF THIS PUBLICATION.
2. CONTROL AND PROTECTION. THE MEANS OF CONTROL AND PROTECTION OF THE PORTION OF THE INSTALLATION NECESSITATING C.T. METERING MAY BE LOCATED ON EITHER THE LINE OR LOAD SIDE OF THE C.T.'S.
3 WIRING ON LINE SIDE OF VOLTAGE CIRCUIT FUSES. THIS WIRING IS INSTALLED BY THE COUNCIL'S OFFICER IF THE STANDARD C.T. UNIT IS USED IN CONJUNCTION WITH A SERVICE CABINET. OTHERWISE, IT IS REQUIRED TO BE INSTALLED BY THE CUSTOMER. IT SHALL BE 2.5 OR 4mm² 0.6/1kV P.V.C. INSULATED AND SHEATHED STRANDED COPPER. WHICH MUST BE ATTACHED TO THE BUSBAR BY MEANS OF A LUG AND 6mm DIAMETER SET SCREW. IT IS TO BE AS SHORT AS PRACTICABLE AND SUITABLY SUPPORTED. (SEE CLAUSES 6.8 AND 7.5)
4 VOLTAGE CIRCUIT FUSE ASSEMBLY. WHERE C.T.'S ARE INSTALLED IN A SWITCH BOARD ENCLOSURE, A PANEL OF INSULATING MATERIAL SHALL BE PROVIDED ADJACENT TO THE ASSOCIATED C.T.'S FOR THE MOUNTING OF THIS ASSEMBLY AND IF REQUIRED. THE METERING NEUTRAL LINK. (SEE CLAUSE 6.7
5. METERING NEUTRAL LINK. WHERE REQUIRED BY CLAUSE 7.5 THE CUSTOMER SHALL PROVIDE AND FIX ON THE PANEL, REFERRED TO IN NOTE 4, A SEALABLE METERING NEUTRAL LINK.
6. C.T. PRIMARY CONDUCTORS AND CONNECTIONS. WHERE A STANDARD C.T. UNIT IS USED, SEE CLAUSES 5.2 AND 5.3 AND DRAWING REFERENCE NO. E.I. 112. FOR SWITCHBOARD CONSTRUCTION, SEE CLAUSES 6.2 AND 6.8 AND DRAWING REFERENCE NO. E.I. 113.
7. CONNECTION BARS AND TERMINALS. FOR METHODS OF TERMINATING CABLES ON THE LINE SIDE OF THE STANDARD C.T. UNIT WHICH IS USED IN CONJUNCTION WITH A SERVICE CABINET, SEE CLAUSE 5.3
8. WIRING FOR METERING PURPOSES. ALL WIRING SHALL BE STRANDED COPPER CONDUCTORS INSTALLED IN ACCORDANCE WITH THE APPROPRIATE CLAUSES OF SECTION 5. CONTRACTOR TO LEAVE 1.5m (MIN.) SPARE LENGTH AT EACH END.
9. CONTACTOR. A CONTACTOR IS NECESSARY IF SUPPLY IS TAKEN AT AN OFF PEAK TARIFF. IT IS REQUIRED TO BE INSTALLED ON THE LOAD SIDE OF BOTH THE CUSTOMER'S CONTROL AND PROTECTIVE DEVICE (S), AND THE C.T.'S (SEE SECTION 6).
10 CONTACTOR CONTROL WIRING. WHERE AN APPROVED CONTACTOR HAS BEEN INSTALLED THE WIRING PROVIDED BETWEEN THE CONTACTOR AND THE COUNCIL'S CONTROL DEVICE SHALL ORIGINATE FROM THE 'LINE SIDE' OF THE CONTACTOR AND BE CONTROLLED AND PROTECTED BY A SWITCH AND 10A H.R.C. FUSE. BOTH OF WHICH ARE SEALABLE. SUPPLY TO THE COUNCIL'S CONTROL DEVICE AND THE CONTROL WIRING SHALL BE ARRANGED FOR CONNECTION TO THE SAME PHASE. (SEE CLAUSE 7.7)

AMENDMENT

1. White 'W' wiring colour was 'Y'.
Ref. 84 G/YELLOW
was green
H.E.B. 8-3-83
AN. 80430 Chk: B.J.T.

2. Notes 3-7 & 10
altered to suit
requirements
of E.E.I. O/C
P.N. 22/60
H.E.B 23-6-86
Checked: M.P.

THE
SYDNEY
COUNTY
COUNCIL

UNLESS OTHERWISE
STATED ALL DIMENSIONS
ARE IN MILLIMETRES

C.T. METERING TYPICAL WIRING DIAGRAM INCLUDING PROVISION FOR CONTROLLED LOAD

REFERENCE NUMBER
E.I. 114

SIZE	NUMBER	AMD.
A2	58054	2

THE
SYDNEY
COUNTY
COUNCIL

No. E.I. 19

JULY, 1986

Alterations And Additions To Existing Installations

CONTENTS

1. SCOPE
2. GENERAL
3. NOTIFICATION
    - 3.1 General
    - 3.2 "Minor" Alterations and Additions
    - 3.3 Alterations and Additions not Classified as "Minor"
    - 3.4 Temporary Supply
    - 3.5 Separation of Supply
4. PROVISIONS FOR ADDITIONAL SERVICE EQUIPMENT
    - 4.1 General
    - 4.2 Where Meters are Bottom Connected
    - 4.3 Where Socket Metering Exists
    - 4.4 Where Existing Meter Board is Unsuitable
5. SPACE REQUIRED FOR METERING
6. REDUCTION OF METERING
7. SUITABILITY OF EXISTING SERVICE ARRANGEMENTS
    - 7.1 General
    - 7.2 Location of Service Equipment
    - 7.3 Protection of Council's Equipment
    - 7.4 Accessibility of Service Equipment
    - 7.5 Required Exits - Ordinance 70
8. AERIAL SERVICE LINES
9. UNDERGROUND SERVICE CABLES
10. BUILDING ALTERATIONS AND ADDITIONS
11. NECESSITY FOR EMPLOYING LICENCED PERSONS
12. ADVICE ON COMPLETING THE READY FOR TEST CERTIFICATE
13. COMPLIANCE WITH THE COUNCIL'S SERVICE AND INSTALLATION RULES AND THE SAA WIRING RULES
14. CONNECTION OF ALTERATIONS AND ADDITIONS PRIOR TO INSPECTION
15. OTHER STATUTORY BODIES
16. FURTHER INFORMATION
17. ISSUE

THE
SYDNEY
COUNTY
COUNCIL

No. E.I. 19

JULY, 1986

Alterations And Additions To Existing Installations

1. SCOPE

This publication sets out the provisions which the Council will generally require the customer to make in accordance with the Council's Service and Installation Rules for the installation of additional service equipment to permit connection of alterations and additions to an existing installation. It also sets down guidelines to enable the electrical contractor to determine whether the existing service arrangements are satisfactory.

2. GENERAL

The customer is required to provide mounting and installation facilities for the service equipment in positions suitable to the Council. "Service equipment" shall mean all Council-owned equipment installed on the premises of a customer, including service lines, cables and busbars; service fuses, links and cabinets; and meters, current transformers and auxiliary control equipment.

In many cases, it will be a straightforward matter for the installing contractor, using information contained in this publication, to determine whether the load can be met without installing any additional meter or load-control device or, if this is not the case, that suitable space exists on the meter panel for it.

In these circumstances, provided the criteria set out in Clause 3.2 of this publication are met, the alterations or additions should be completed without a site visit by Council's staff prior to submission of the Ready for Test Certificate.

3. NOTIFICATION

3.1 General

The Council requires an Application For Supply Of Electricity form (Form 1) to be completed for any alteration or addition which is not classified as "minor" in terms of Clause 3.2. The application should be lodged as soon as details are known and work should not be carried out until advice is received from the Council as indicated in Clause 3.3.

Where an alteration or addition to a customer's installation is classified as "minor", the only notification required by the Council is the lodgement of a Ready For Test Certificate. However, an Application For Supply Of Electricity form is required if the alteration or addition involves the provision of supply to an additional customer. A completed Ready For Test Certificate is required to be lodged within 14 days of carrying out various types of work on a customer's installation as set out in Section 2 of publication E.I. 3, "Ready For Test Certificates".

3.2 "Minor" Alterations and Additions

An alteration or addition is classified as "minor" if all of the following conditions apply:

(a) The additional load, assessed by calculation in accordance with Clause 2.5 of the SAA Wiring Rules, does not exceed 10 kW or is due to a cooking range in domestic premises.

(b) It does not involve alterations to service mains, provision of additional phases of supply, changing to Demand Tariff or Time of Use Tariff, or taking supply at Process Heating Tariff, Night Usage.

(c) There is suitable space on the existing meter board or panel for any additional or replacement meters necessary.

(d) The existing service arrangements comply with the Council's requirements in respect of access and location. (This is considered only where consumers mains or sub-mains are being replaced).

(e) The work does not involve Council officers working in conjunction with the customer's electrician or contractor.

(f) The connection of the additional equipment is unlikely to adversely affect the supply to other customers. (See Service and Installation Rule 4.2.9).

(g) The premises are not located in a rural, isolated or undeveloped area.

(h) In the case where it is proposed to combine separately metered portions of an installation, the combined load would not exceed 100A per phase.

3.3 Alterations and Additions not Classified as "Minor"

Where an alteration or addition does not fall into the above classification of "minor", the Council will acknowledge receipt of the required application by -

(a) writing to the customer indicating whether any particular conditions or arrangements apply; or

(b) sending to the premises an officer who will leave a notice indicating the provisions which the customer must make for the Council's service equipment.

Where the nature of the alterations make it necessary for supply to be isolated or for the Council to work in conjunction with the contractor, suitable arrangements should be made beforehand with an officer at the appropriate Customer Supply and Services Office. For details of the locations of the offices and their telephone numbers, see publication E.I. 2, "Customer Supply Inquiries". In normal circumstances, notice of at least two working days will be required.

Service and Installation Rule 3.2.3 prohibits persons, other than Council employees, from making any connection to or disconnection from, the Council's service line, except as authorised by the General Manager.

3.4 Temporary Supply

Charges are made by the Council for any work necessary to make temporary additional supply available. The customer is required to make written application and the Council will advise the applicant of the conditions and charges applicable.

3.5 Separation of Supply

When a contractor has to rearrange an existing installation into separate portions serving two or more occupants and requiring individual metering, the contractor should take appropriate precautions to avoid as far as practicable any portion being left without supply pending an inspection being made. Where this cannot be avoided, contractors are requested to minimise the time that supply is unavailable to any customer. This may be achieved by the use of links provided by the contractor. Separation of supply should be discussed in advance with an officer at the appropriate Customer Supply and Services Office so that special arrangements can be made.

4. PROVISIONS FOR ADDITIONAL SERVICE EQUIPMENT

4.1 General

A maximum of two separately metered portions of an installation may be connected to the load side of a service fuse. Where this number is to be exceeded, the customer is required to provide and install a sealable connecting bar or link for the meter active conductors. It shall be mounted at a suitable location easily accessible for safe working by the Council's officers.

4.2 Where Meters are Bottom Connected

Where sufficient space exists on an existing meter board, which has one or more bottom connected meters on it, the Council will mount any additional meter or load-control device on it. Thermoplastic or elastomer-insulated stranded-copper cables must be provided by the customer, in adequate lengths at the meter position, to enable the connections to be made by the Council.

Sheathed cable is required in the case of wooden boards and in any case where its use would be necessary in order to comply with Clause 3.12 of the SAA Wiring Rules.

Load-carrying cables connected to metering or load-control equipment shall be of adequate size for the relevant maximum demand calculated in accordance with Clause 2.5 of the SAA Wiring Rules, with a minimum size of 4 sq mm and a maximum size of:

(a) 25 sq mm for single-phase meters,
(b) 16 sq mm for polyphase meters, and
(c) 4 sq mm for load control devices.

Other cables associated with meters shall be 4 sq mm.

Where bottom connected meters are mounted on an Energy Authority standard meter-box panel, the panel is required to be drilled for any additional metering or service fuse. For drilling requirements see drawing E.I. 109, which is attached. All wiring is required to be installed ready for connection to the meters and other service equipment.

4.3 Where Socket Metering Exists

Where suitable space exists on an existing meter panel which already has a plug-in meter or load-control device on it, the customer is required to install the required number of socket bases and associated wiring for any additional meter or load-control device in accordance with requirements set out in publications E.I. 7, "Provisions For Service Equipment In Single Domestic and Small Installations" and E.I. 8, "Provisions For Service Equipment In Multiple Installations".

4.4 Where Existing Meter Board is Unsuitable

Where there is insufficient space on an existing meter panel for the additional equipment or a new metering position has to be established, the customer is required to provide facilities for mounting the Council's service equipment. The Council's requirements will be indicated by means of a Notice.

5. SPACE REQUIRED FOR METERING

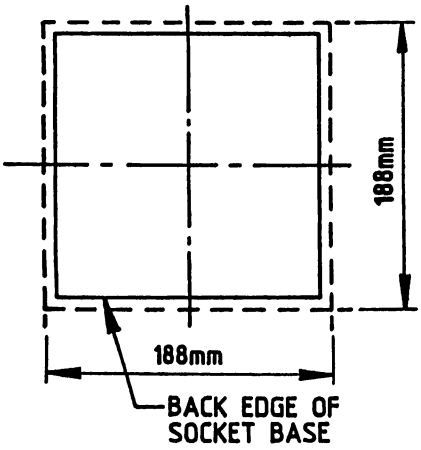
The contractor is required to indicate in Section 5 of the Ready For Test Certificate whether suitable space exists on the present meter board for any additional meter or load-control device which may be necessary.

In deciding this, the contractor should note the following:

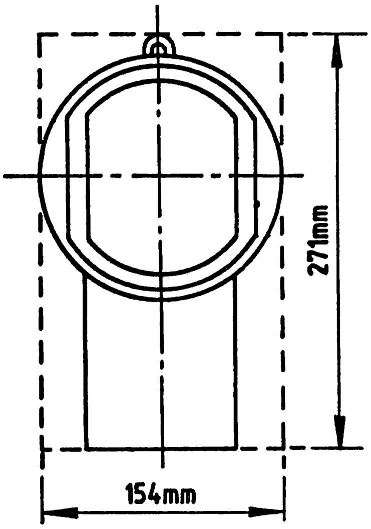
(a) If the installation is already metered using a polyphase meter, and the SAA-calculated maximum demand on any phase does not exceed 60 amperes, the continued use of a polyphase meter is satisfactory. However, where the proposed additions would cause the maximum demand to exceed this figure, the customer will generally be required to provide facilities for the installation of single-phase meters.

DIAGRAM 1

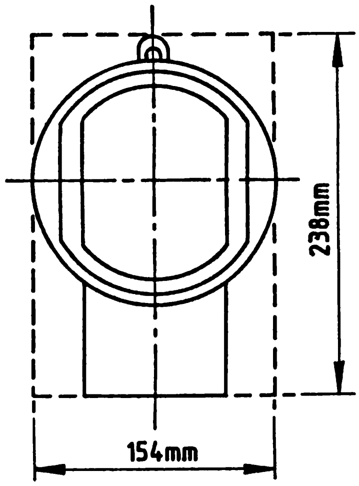
MINIMUM SPACE REQUIREMENTS FOR METERING EQUIPMENT



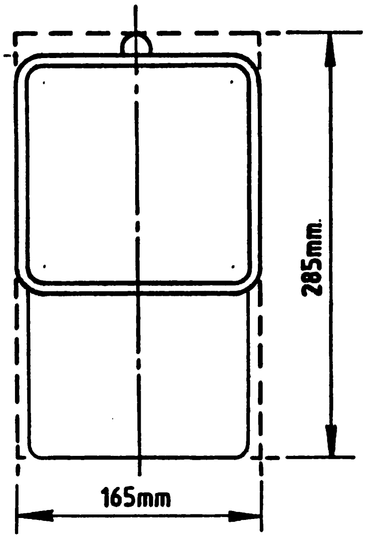
1. SOCKET BASE FOR PLUG-IN METER OR LOAD CONTROL DEVICE.



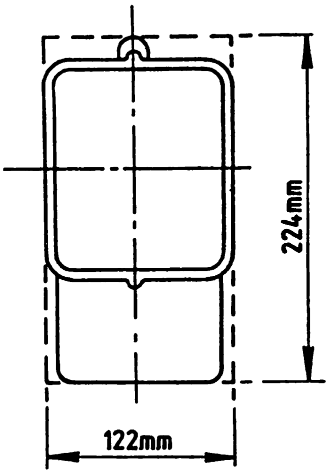
2. BOTTOM-CONNECTED SINGLE-PHASE ENERGY METER FOR OTHER THAN SINGLE DOMESTIC AND OFF-PEAK TARIFF.



3. BOTTOM-CONNECTED SINGLE-PHASE ENERGY METER FOR SINGLE DOMESTIC AND OFF-PEAK TARIFF.



4. BOTTOM CONNECTED 60A POLYPHASE ENERGY METER.



5. BOTTOM-CONNECTED LOAD CONTROL DEVICE

NOTES: 1. The above sketches indicate the minimum clear space necessary on a meter board to accommodate an additional meter or load-control device. No portion of a meter or load-control device is permitted to project beyond the edge of the meter board.

2. If located in a box or cupboard, the depth from the face of the board to the inside of the door is required to be 175 mm minimum.

3. In general, the minimum clearance around the Council's meter boards is required to be 75 mm.

(b) The Council is prepared to install additional polyphase watthour meters, where–

  (i) the customer would incur unreasonable expense in altering the metering position for the installation of bottom-connected single-phase meters and the SAA-calculated maximum demand on any phase does not exceed 60 amperes, or

  (ii) a dual-register meter is required by a customer taking supply at the Process Heating Tariff with Night Usage.

(c) Current-transformer metering will generally be required where additions make it likely that the maximum demand will exceed 100 amperes per phase. Special provisions are necessary for the metering instruments and transformers in accordance with publication E.I. 18, "Current Transformer Metering".

(d) The number of phases of supply which will normally be provided without charge is covered by Service and Installation Rule 2.8.

(e) The space required on an existing meter board for mounting additional bottom connected meters and load-control devices is shown on Diagram 1. The layout of bottom connected metering equipment mounted on an Energy Authority standard meter-box panel is given on drawing E.I. 109.

6. REDUCTION OF METERING

The Council requires an installation to be arranged so that the minimum practicable number of meters may be used.

Where separately metered portions of an installation are proposed to be combined, the load conductors may be paralleled by connection to a suitable link. Alternatively, the load may be consolidated by the customer at the switchboard.

Disused socket bases may be left in position with line conductors remaining energised, providing the load conductors are suitably terminated. In this instance, the Council will provide and install a blanking plate which will be sealed under the base's retaining ring.

7. SUITABILITY OF EXISTING SERVICE ARRANGEMENTS

7.1 General

Where consumers mains are being replaced, Question 3(b) under Section 5 of the Ready For Test Certificate calls for the contractor to advise whether the location of the service equipment complies with the requirements of this publication. This is in order to avoid the contractor proceeding with work which may be redundant in the event that the Council requires unsatisfactory service arrangements to be altered in conjunction with the other work. Clauses 7.2 and 7.6 below summarise the requirements to be met for service arrangements in order to assist the contractor in checking the suitability of the existing arrangements.

7.2 Location of Service Equipment

Locations considered unsuitable for the mounting of metering and control equipment are dealt with in Service and Installation Rule 3.4.

7.3 Protection of Council's Equipment

Requirements to prevent the Council's equipment being affected by weather or other causes are dealt with in Service and Installation Rule 3.8.

7.4 Accessibility of Service Equipment

Requirements for access to service equipment are dealt with in Service and Installation Rule 3.5 and also in publications E.I. 7 and E.I. 8.

7.5 Required Exits - Ordinance 70

Ordinance 70 under the Local Government Act prohibits the installation of electricity meters and ducts in an exit required for fire-escape purposes or any corridor, hallway, lobby or the like leading to such an exit, unless enclosed by a construction which comprises, or is lined with, a non-combustible material or a fire-protective material specified in the Ordinance. Local Councils may apply these requirements in the case of existing buildings, which are being altered or having their use changed.

Required fire-escape exits or paths leading to such exits (other than stairways and ramps) are required to have a minimum unobstructed width of 1020 mm and a minimum unobstructed height of 2030 mm (2040 mm in the case of institutions or places of assembly).

It is the customer's responsibility to obtain local council approval for the installation of the service equipment in such locations.

8. AERIAL SERVICE LINES

Where alterations and additions are being made affecting overhead service lines, the relevant requirements of publication E.I. 15, "Aerial Service Lines" apply.

9. UNDERGROUND SERVICE CABLES

Where alterations and additions are being made affecting underground service cables, the relevant requirements of publication E.I. 16, "Underground Service Cables In Single Domestic And Small Installations" or E.I. 17, "Underground Supply To Installations With Demands Exceeding 100A Per Phase" apply.

10. BUILDING ALTERATIONS AND ADDITIONS

Before any building alterations or extensions are undertaken which may affect any Council mains or equipment located on or close to the premises, the customer should consult the Council. Where it is necessary to relocate any service equipment, the Council may require the customer to bear the cost involved.

The customer shall ensure that the location of, and access to, service equipment complies with the requirements indicated in this publication and is not restricted or the location otherwise rendered unsuitable as a result of building alterations or extensions. If this occurs, the customer is required to restore satisfactory access or arrange with the Council for relocation of the service equipment.

11. NECESSITY FOR EMPLOYING LICENSED PERSON

The Electricity Development Act requires that all electrical installation work shall be carried out by or under the supervision of persons who are licensed as prescribed.

12. ADVICE ON COMPLETING THE READY FOR TEST CERTIFICATE

Details regarding the completion and lodgement of the Ready For Test Certificate together with further information is available in publication E.I. 3, "Ready For Test Certificates".

13. COMPLIANCE WITH THE COUNCIL'S SERVICE AND INSTALLATION RULES AND THE SAA WIRING RULES

Alterations and additions to an existing installation are required to comply with the Service and Installation Rules.

In this regard, the customer shall provide mounting and installation facilities for service equipment in accordance with any relevant publication in the E.I. Series, a list of which is given in Section 16.

It should be noted that in accordance with Service and Installation Rule 4.3, an existing installation which does not employ the M.E.N. system of earthing is required to be converted to this system when any addition or alteration is made.

Alterations, additions and repairs to electrical installations are also required to comply with Clause 1.5 of the SAA Wiring Rules.

14. CONNECTION OF ALTERATIONS AND ADDITIONS PRIOR TO INSPECTION

The Consumers' Electrical Installations (Safety) Regulations require that, except with the permission of the electricity supply authority concerned, a person shall not connect to the supply any consumer's installation, or any addition or alteration thereto, prior to its inspection by the supply authority.

Such permission is granted by the Council where -

(a) additional or replacement equipment is connected to an existing final sub-circuit which is already connected to the supply, provided that the additional work is complete, complies with the SAA Wiring Rules and the Service and Installation Rules and a Ready For Test Certificate is lodged with the Council within 14 days.

(b) control and protective equipment at the origin of an additional circuit is connected to a switchboard which is already connected to the supply, provided that the additional work is complete, complies with the SAA Wiring Rules and the Service and Installation Rules, a Ready For Test Certificate is lodged with the Council within 14 days and the circuit is isolated in the following manner:

(i) Additional fuse-protected circuit

Each fuse carrier shall be removed from its base and labelled with a special label provided by the Council for the purpose and tied to the switchboard.

(ii) Additional circuit protected by an overcurrent circuit-breaker

The circuit-breaker shall be left in the "Off" position, and a special label provided by the Council for the purpose shall be attached to the operating device of the circuit-breaker in such a manner that it cannot be closed without detaching or removing the label. Where this is not possible, the label shall be attached to the circuit-breaker in such a manner that it cannot be closed without the label being noticed.

(c) the customer has entered into an Installation Inspection Agreement.

15. OTHER STATUTORY BODIES

It is the customer's responsibility to ensure that the requirements of other statutory bodies have been met, before any work is undertaken or expenditure incurred. Council's approval of electrical work does not imply approval by any other body.

16. FURTHER INFORMATION

Other publications which deal with related matters are as follows:

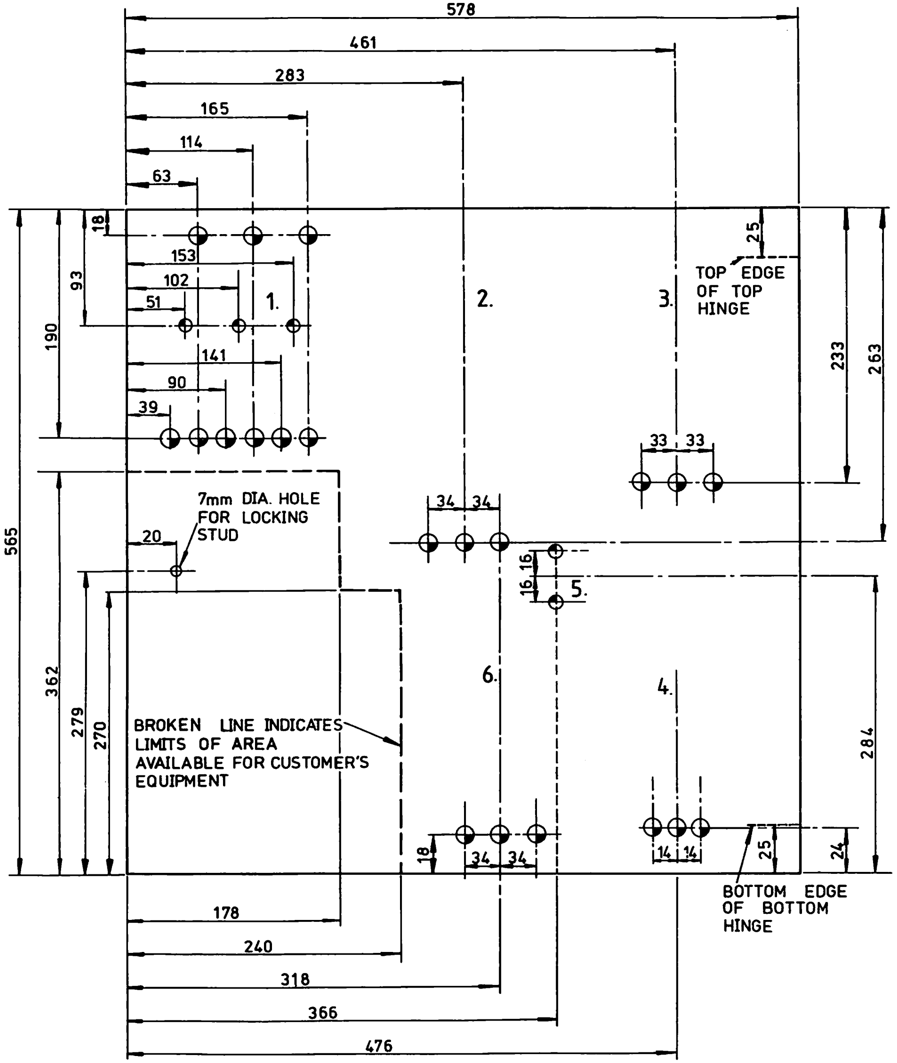
Service and Installation Rules and General Conditions of Supply.

E.I. Series publications -

E.I. 1 - "Customer Supply Procedures".
E.I. 2 - "Customer Supply Inquiries".
E.I. 3 - "Ready For Test Certificates".
E.I. 7 - "Provisions For Service Equipment In Single Domestic And Small Installations".
E.I. 8 - "Provisions For Service Equipment In Multiple Installations".
E.I. 13 - "Domestic Electrical Installations".
E.I. 15 - "Aerial Service Lines".
E.I. 16 - "Underground Service Cables In Single Domestic And Small Installations".
E.I. 17 - "Underground Supply To Installation Having Demands Exceeding 100A Per Phase".
E.I. 18 - "Current Transformer Metering".

17. ISSUE

This publication supersedes the issue dated August, 1984.


578
461
283
165
114
63
18
153
102
51
1.
2.
3.
93
190
141
90
39
25
TOP EDGE OF TOP HINGE
233
263
33
33
565
7mm DIA. HOLE FOR LOCKING STUD
20
34
34
16
16
5.
6.
4.
362
279
270
BROKEN LINE INDICATES LIMITS OF AREA AVAILABLE FOR CUSTOMER'S EQUIPMENT
284
18
34
34
14
14
25
24
BOTTOM EDGE OF BOTTOM HINGE
178
240
318
366
476

REFERENCE DRAWINGS

STANDARD METER BOX PANEL LAYOUT AND DIAGRAM OF CONNECTIONS (E.I. 104)	A2-55729
STANDARD METER BOX PANEL DRILLING DETAILS AND HEIGHT LIMITATIONS (E.I. 103)	A1-43166

NOTES

1. THE DRILLING DETAILS SHOWN APPLY WHERE THE CUSTOMER IS REQUIRED TO MAKE PROVISION FOR THE INSTALLATION OF A SERVICE FUSE, BOTTOM-CONNECTED METER OR OFF-PEAK LOAD CONTROL DEVICE ON AN ENERGY AUTHORITY OF N.S.W. STANDARD METER BOX PANEL. IT IS GENERALLY APPLICABLE ONLY WHERE ADDITIONS ARE BEING MADE TO AN EXISTING INSTALLATION.
2. THE DRILLING DETAILS FOR SOCKET BASES TO TAKE PLUG-IN METERS AND OFF-PEAK CONTROL DEVICES ARE SHOWN ON DRAWING NO. E.I. 103 WHICH IS ATTACHED TO PUBLICATION E.I. 7.

DRILLING LEGEND

⊕	10mm DIA. HOLES FOR CABLES
⊕	5·5mm DIA. HOLES FOR EQUIPMENT FASTENING

EQUIPMENT LEGEND

1. SERVICE FUSES - 3 IF REQUIRED.
2. SINGLE PHASE OR POLYPHASE PRINCIPAL TARIFF METER WITH EXTENDED TERMINAL COVER.
3. SINGLE PHASE OFF-PEAK TARIFF METER.
4. OFF-PEAK CONTROL DEVICE.
5. SERVICE NEUTRAL LINK ON REAR OF PANEL.
6. SINGLE PHASE PRINCIPAL TARIFF METER WITH EXTENDED TERMINAL COVER.

AMENDMENT

SYDNEY
COUNTY
COUNCIL

UNLESS OTHERWISE STATED ALL DIMENSIONS ARE IN MILLIMETRES

STANDARD METER BOX PANEL
WITH BOTTOM-CONNECTED METERING
DRILLING REQUIREMENTS FOR
ADDITIONAL EQUIPMENT

REFERENCE NUMBER	AMD
E.I. 109	1